Polarisation of employment over households revisited: the Belgian case

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Abstract

Over the last 30 years the share of individuals in the Belgian working-age population without employment ('individual joblessness') has fallen continuously, while the share of households with no working-age member in employment ('household joblessness') remained fairly stable. In this paper we examine why individual joblessness and household joblessness diverge.

The growing gap between both measures of joblessness reflects changes in household composition and changes in the distribution of individual employment over households. We describe the latter phenomenon by constructing a measure of 'polarisation of employment over households', which is based on the difference between observed and 'expected' household joblessness. On the basis of changes in household formation and changes in individual joblessness one would have expected household joblessness in Belgium to decrease. However, increasing polarisation, i.e. an increasingly unequal distribution of jobs over households, has counteracted this 'expected' evolution.

Singles constitute households that are most vulnerable to the polarisation we describe, but a shift towards such more vulnerable households offers only a small share of the explanation of the evolution over time. We observe rising levels of polarisation, both in single adult households and couples. Within these household groups, changes in polarisation are similar, but increasing polarisation among couples is the most important factor in the overall increase in polarisation.

The personal characteristics associated with individual joblessness (gender, education, age, region, origin) explain a significant part of this polarisation on the level of households. In 2012, almost half of polarisation in single adult households can be explained through typical individual characteristics of singles. In couples almost one third of polarisation is related to individual characteristics and marital selection. However, this also means that a substantial part of household joblessness cannot be explained by these individual characteristics.

A comparison of Belgium with three low-polarisation countries (Germany, France, the Netherlands) and two high-polarisation countries (Ireland and the United Kingdom) suggests that polarisation is high in Belgium, when compared to Germany, France and the Netherlands, for the following reason. First, more than in those countries, Belgian singles have a weak socio-economic profile in terms of age, skills and origin: compared with the total population, they are more often low-skilled, older, and born outside the European Union. Second, the difference in individual joblessness between individuals with strong profiles and individuals with weak profiles is larger in Belgium than in those countries (whether it concerns singles or not). The latter factor is reinforced by regional differences within Belgium. Third, educational homogamy in couples is larger in Belgium than in Germany, France and the Netherlands.

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1. Introduction

Employment can be measured on an individual level or on a household level. Employment rates are typically based on the proportion of working-age individuals who are in employment. These aggregate employment rates, based on individual data, may not fully capture the economic and social impact of joblessness. Exclusion of a person from the labour market not only affects him or her directly, but all the members of the household; it increases economic insecurity for the entire household. In countries with limited collective mechanisms to protect individuals against economic shocks (in particular new member states and Southern European countries), this household perspective is particularly important.

At-risk-of-poverty rates and income inequality are typically measured at the level of the household. Hence, social policy analysis should also consider employment at the household level. The emphasis on household work intensity in the *Europe 2020* strategy is based on this rationale. *Europe 2020* has integrated the household dimension into the indicators on exclusion from the labour market[1]. However, research on the appropriate measure of joblessness at the household level remains limited.

Corluy and Vandenbroucke (2013) discuss alternative concepts of household employment and the underlying definitions of employment and work intensity; the indicator of household joblessness we apply in this paper is but one instance of a class of indicators. Our focus in this paper is on the observation that individual-based and household-based measures of joblessness offer conflicting signals about labour market performance. In Belgium, individual joblessness fell continuously since the early 1980s while household joblessness remained fairly stable. Such an observation is not new and is not confined to Belgium. The discrepancy between individual and household joblessness has been documented comprehensively for a number of countries by Gregg and Wadsworth (2008, 2012)[2]. However, understanding the relationship between individual and household joblessness is far from obvious. By exploring the Belgian data, this paper highlights *caveats*, difficulties and possible pitfalls in our understanding of the relationship between levels and patterns of individual and household employment.

2. Background

When constructing aggregate indices of economic well-being, Berloffa and Modena (2011) take into account the household dimension of (un)employed individuals. They propose a measure of household economic insecurity, the 'inactive-unemployed dependency rate', defined as the average number of inactive individuals in the household that depend on the employed ones. Similar unemployment rates can be associated with different levels of economic insecurity for the population, because demographic change and household formation processes affect the inactive-unemployed dependency rate. Even if the unemployment rate does not change, economic insecurity can increase if the number of one-earner households or single parent households increases relative to other types of households. Marital instability can increase the vulnerability of households.

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[1] Indicators in the *Europe 2020* strategy include both the share of persons (aged 18-59) who are living in jobless households (households where no working age member is at work) and the share of the population (aged below 60 years) living in households with a very low work intensity (households where the working age members work less than 20 percent of their total work potential).

[2] See also Gregg & Wadsworth (1996), OECD (1998), Dawkins, Gregg & Scutella (2002), Gregg & Wadsworth (2008), Gregg, Scutella & Wadsworth (2012), Brandolini & Viviano (2013), Ozdemir & Ward (2013), Duyver (2013).

Gradin et al. (2014) also propose a framework for measuring employment deprivation among households. Their aggregate measure takes into account the incidence of household unemployment (how many households are touched by the lack of employment of any of its members), its intensity (how far are households on average from being employment non-deprived), and the inequality of employment exclusion across households (how concentrated is unemployment in households). Their aim is to ascertain the extent to which the incorporation of a household dimension changes profiles and trends in unemployment over countries. In general, Gradin et al. (2014) observe that the percentage of economically active individuals living in households affected by unemployment is large in countries where the unemployment rate is also large. In contrast, they observe larger employment deprivation intensity and inequality in countries with middle-range levels of unemployment, such as Germany and Belgium. Brandolini and Viviano (2013) also illustrate that the household dimension changes country profiles and trends in employment and unemployment.

This household employment literature focuses on the construction of indicators of household employment and the relative ranking of countries; it does not explore the reasons for divergences between individual and household indicators. Gregg, Scutella and Wadsworth (2010, 2012) analyze the factors contributing to differences between individual and household measures: household formation and the distribution of employment over households. In order to describe the distribution of employment over households, they construct an indicator of 'polarisation'. Increasing polarisation, mainly observable in two-adult households, is the most important factor explaining the divergence between individual and household joblessness in five countries up to the mid-2000s.

Meanwhile, researchers interested in poverty started to examine the link between the poverty records of welfare states and household employment rates that characterize welfare states. Shifting attention from individual to household employment is a natural move in poverty research. We measure income poverty on a household basis, hence, the rather weak correlation that is often observed between individual employment rates and poverty rates across mature welfare states should, prima facie, not come as a surprise. However, the solid association identified between higher household employment and a lower at-risk-of-poverty at the micro-level of households is much weaker at the macro-level[3].

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[3] Paul de Beer (2007) analyzes the failure of the Lisbon Strategy with regard to its poverty goal on the basis of the relationship between poverty and household joblessness, contrasting long-term changes in individual joblessness and household joblessness. The OECD Employment Outlook 2001 (2001, 59-61) pointed to the absence of significant correlations between aggregate employment and unemployment rates on one hand and poverty measures on the other hand. This OECD finding is cited in Gregg and Wadsworth (2008) and may have inspired different authors, such as Dickens and Ellwood (2002), Nickell (2004), and de Graaf-Zijl & Nolan (2012) to focus on household joblessness in analyses of poverty. The analyses of poverty trends during the 'good economic years' collected in the 2000s in the volume by Cantillon and Vandenbroucke (2014) also emphasize the discrepancy between individual joblessness and household joblessness. As explained in Cantillon and Vandenbroucke (2014, see note 6 p. 54, and Table 3.3 p. 113), with regard to the correlation between individual employment rates, household employment rates and poverty, our results contradict the findings by the OECD; however, the latter relate to a different sample of countries (ECHP countries and Canada and the USA), a different database (ECHP) and a different time than the correlations we obtain on the basis of SILC for European welfare states in the 2000s. For a recent examination of the link between household employment patterns and child poverty on a cross-country basis, see Vandenbroucke, Diris and Verbist (2013). For a decomposition of cross-country differences in child poverty and inter-temporal changes, with a focus on Belgium, see Vandenbroucke and Vinck (2013).

3. Purpose and structure of the paper

All household employment measures show rising inequality in the distribution of employment at the household level. Moreover, Gradin et al. (2014) show that country rankings change substantially if only the most severe household employment deprivation is examined, i.e. household joblessness (even a very limited job was not available to members of the household). In fact, of all EU24 countries under review, Belgium registers the highest levels of employment deprivation inequality among deprived households, indicating that the burden of joblessness is strongly concentrated in certain households, while individual unemployment rates rank along the EU24 average.

We will use the concept of polarisation as constructed by Gregg, Scutella and Wadsworth (2010, 2012) to quantify the sources of divergence between individual and household joblessness. By elaborating upon it, we will highlight *caveats*, difficulties and possible pitfalls in our understanding of the relationship between individual and household employment.

A first *caveat* concerns the interpretation of what we observe. We see that individual joblessness has decreased considerably in Belgium, in percentage points, since 1983. In contrast, household joblessness remained more or less stable, but the share of individuals in 'full-employment households' (households where all adult members are in employment) increased spectacularly, from 40% to 65% of the Belgian population. Now, the spectacular increase in the share of individuals in 'full-employment households' is, first of all, the mathematical corollary of the substantial rise in individual employment rates: it is what one would expect if (a growing number of) jobs would have been distributed randomly across Belgian households[4]. The relevant question is about the portion of the discrepancy between the evolution of household employment and individual employment that cannot be explained by the mathematics of random distributions, i.e. the part of the observed discrepancy that calls for demographic, economic, sociological and cultural explanations, which may be region- or country-specific. This first *caveat* underscores the relevance of a polarisation concept, such as the one proposed by Gregg and his co-authors, as it can be used to quantify the differences between observed and expected household joblessness and allows for further decomposition over household subgroups and individual characteristics that drive joblessness. A second *caveat* concerns the different realities behind the notion of 'household joblessness'; the social realities behind household joblessness are rather different in the three Belgian regions.

The polarisation index is based on a counterfactual (or 'expected') household joblessness rate, i.e. the rate that would occur if jobs were randomly distributed over the population, given the specific household size structure in the country under examination. Polarisation is defined as the difference between the actual and the expected household joblessness rate: it measures the extent to which there are more (or fewer) jobless households than expected in the case of a random distribution of employment across individuals, given the national household size structure. This technique allows for two refinements. First, the overall polarisation of jobs over households can be decomposed on the basis of household size subgroups in the population. It appears that polarisation is much higher in households with only one working-age adult, and that cross-country differences in polarisation (as observed in 2012) are driven to a large extent by different shares of the population being part of single-adult households. This observation highlights a conceptual *caveat* – and possibly a pitfall – in understanding 'polarisation'. What we label 'polarisation' in this analysis is driven, in part, by the

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[4] In other words, the decline in the parameter α (a ratio of a household employment indicator on an individual employment indicator) that drives the analysis of disappointing poverty trends by Paul de Beer (2007) is, in part, a mathematical truism. The evolution of the parameter α is a black box that contains both what one may expect on the basis of the mathematics of random distribution and what is to be explained by economic, sociological and cultural shifts in European labour markets and societies.

well-known fact that singles and lone parents are typically less employed than other adults. Second, the construction of the polarisation index can be refined by taking into account observable traits of individuals that influence both individual unemployment risks and household formation, such as gender, age, education and the region where they live. Gregg and his co-authors use these observable traits to calculate 'conditional polarisation'.

A complexity that emerges in this paper is that the analysis of inter-temporal change in polarisation and the analysis of cross-country differences in levels of polarisation yields different emphases: whilst today's cross-country differences in polarisation levels are driven to a large extent by cross-country differences in the share of individuals in single-adult households, the increase in polarisation in Belgium since 1983 is mainly driven by the increasing level of polarisation in couples. The paper first concentrates on inter-temporal changes and interregional differences within Belgium. Subsequently, cross-country differences are shown and decomposed on the basis of household size. By comparing household joblessness in countries with similar household size structures we explore the reasons for the relatively bad position of Belgium.

Finally, but importantly, the relationship between poverty and household employment rates is complex[5]. The binary distinction between 'jobless' and 'non-jobless' households is probably too crude to be very meaningful in poverty analysis. However, in the last section of this paper we show that our polarisation index correlates strongly with a 'relative severity of work poverty' measure, which is based on actual observations of (continuous) work intensity. The correlations we establish between these fine-grained household employment indicators and the more crude measures of individual joblessness and household joblessness, underscore the relevance of the polarisation analysis for poverty research, but also the circumspection with which it should be applied.

We wrap up the analysis in a concluding section, and point out questions for further research.

4. Data and definitions

The Belgian Labour Force Survey has been conducted by the Belgian Bureau of Statistics[6] since 1983. It contains detailed information on household composition and labour market position. Around 55,000 working age individuals are surveyed yearly.

Throughout this paper we will use 'adult' as a short cut for working-age adults. 'Working age' refers to the age bracket 20-59, excluding full-time students and those adults living in a household of which the reference person is older than 59. By excluding students and the elderly, we try to minimize the effects of educational participation and retirement on the adults' decision of participating in the labour force[7]. At the household level, we cluster households by the number of adults present in the household. Doing so, we distribute all individuals over three relevant household sizes, i.e. single-adult households, couples and those households with at least three working-age adults.

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[5] See footnote 3 for literature exploring this relationship.
[6] ADSEI: Algemene Directie Statistiek en Economische Informatie
[7] We exclude full-time students both when we count the members of the household who are in employment (to classify the household as 'jobless' or 'not jobless'), and when we define the population for which we calculate the household joblessness. Because detailed information on the educational participation of respondents is lacking in the early Belgian survey we consider respondents as 'full-time students' when they are between 20 and 24 years old and their ILO status is 'inactive'.

We use an ILO concept of employment. According to this concept, an individual is in employment if he or she was employed for at least one hour in the reference week of the survey. The household is jobless if no member in the age bracket 20-59 (excluding full-time students and households of which the reference person is older than 59) is in employment, so defined. We are primarily interested in the population share that is not in any employment. Adults in a jobless household can be either ILO unemployed or inactive in the labour force. As a short cut, we will use 'household joblessness (rate)' to refer to the share of adults (excluding the same categories) living in jobless households. 'Individual joblessness' refers to the proportion of individual adults who are not in employment. The denominator in both indicators is the number of adults, so defined.

The concept of employment that we use in this paper is rather elementary. We do not impose any scale of employment intensity, for example part-time versus full-time, nor effective hours and months that have been achieved within an entire calendar year. Over the last decade, different concepts of household employment have emerged, each with different demarcations of the relevant populations and different definitions of employment; these differences have an impact on the ranking of countries by their population in household joblessness[8]. On the other hand, a binary employment definition offers great advantages for decomposing trends in household joblessness over time, for comparison of countries and regions, and for the construction and evaluation of a polarisation index.

In the last section of this paper, we discuss the link between household employment rates and poverty, and show to what extent different indicators of household employment correlate with each other. We compare ILO-based indicators (household joblessness, the polarisation index) and the fine-grained indicators that are based on work intensity with EU-SILC data (survey year 2011).

5. Trends in individual employment and household employment in Belgium

Individual-based and household-based measures of joblessness offer conflicting signals about labour market performance. Figure 1 documents the evolution of the Belgian labour market, using both an individual and a household perspective.

[Figure 1 about here]

The observed evolution is shown in the solid lines in Figure 1. In 2012, individual joblessness was 11.4 percentage points lower than in 1983. On the contrary, household joblessness was 1.5 percentage points higher. The share of adults in 'full-employment households' (households where all adults are in employment) increased by 25.1 percentage points (to 65.4 percent in 2012), while the share of adults in 'mixed-employment households' (with a mixture of working and non-working adults) decreased by 26.5 percentage points. In other words, 'full-employment households' replaced 'mixed-employment households and household joblessness remained stable. If we rank adults on the basis of the employment situation of their household, in 1983 the median adult belongs to a 'mixed-employment household'; from 1991 onwards, the median adult belongs to a 'full-employment household'. These figures illustrate the rapid change from a male breadwinner model to a dual earner welfare model.

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[8] Corluy and Vandenbroucke (2013) explore alternative definitions of household employment in section 3.1 and the impact of different underlying concepts on the ranking of household joblessness over countries in appendix 3.

Next to the observed evolution in the employment pattern, shown with the solid lines, the dotted lines in Figure 1 present a counterfactual household employment pattern, which one would have 'expected' if jobs were randomly distributed over households. The dotted red line is the expected share of adults in full-employment households, if jobs were randomly distributed over households; the dotted yellow line is the expected share of adults in mixed-employment households, under the same hypothesis; the dotted green line is the expected household joblessness, in the same counterfactual vein. Consider the following simple example to understand the nature of these counterfactuals: a population of working-age adults is organized in couples of two adults and singles; a fraction δ of the adults are jobless, i.e. the individual risk to be jobless is equal to δ. If the distribution of jobs over households is random, we would expect a fraction δ of the singles to be jobless and a (smaller) fraction δ^2 of the couples to be jobless; conversely, we would expect a fraction 1-δ of the singles and a fraction (1-δ)^2 of the couples to constitute full-employment households; finally, a fraction (2δ-2δ^2) of the couples would constitute mixed-employment households. On this basis, we can calculate a counterfactual share of adults in full-employment households, a counterfactual share of adults in mixed-employment households and a counterfactual share of adults in jobless households. The example highlights the following counterfactual expectations. First, with a random distribution of jobs, joblessness will be less prevalent in larger households: larger households allow more risk pooling (with regard to the risk of being a jobless individual) than smaller households. Second, when δ is smaller than 0.50, the share of individuals in mixed-employment households decreases when δ decreases, i.e. the prevalence of mixed employment households *de*creases when the individual employment rate *in*creases, for a given (frozen) household size structure. In the same vein, we can show that, for any value of δ, the 'expected' ratio of the share of adults in full-employment households to the share of individual adults in employment will increase when individual joblessness decreases. Simultaneously, the 'expected' ratio of household joblessness to individual joblessness will decrease when individual joblessness decreases.

The dotted lines in Figure 1 are counterfactuals based on the actual household size structure in Belgium, as it evolved from 1983 to 2012; i.e. the household structure is not frozen, as in the theoretical example in the previous paragraph. Given the evolving household size structure, the expected share of adults in full-employment households (the dotted red line) would have increased by 19.1 percentage points; that is less than the observed increase of 25.1 percentage points, but still a considerable increase. The expected share of adults in mixed-employment households (the dotted yellow line) would have decreased by 15.4 percentage points, an important decline but considerably less than what we observed. The expected household joblessness would have diminished by 3.7 percentage points, instead of slightly increasing. In other words, a part of the actual evolution we see in the solid lines in Figure 1 is what we would expect, purely on the basis of the mathematics of random distributions and the concomitant risk pooling in households that contain more than one adult. For instance, the spectacular increase in the share of adults in full-employment households and the decrease of the share in mixed-employment households are, at least partly, a mathematical corollary of the substantial rise in individual employment rates. However, comparing the solid and the dotted lines in Figure 1 also explains that the share of adults in full-employment households has grown even faster than expected, and that the standstill in household joblessness could have been a substantial decrease given a random distribution of jobs. Hence, from the point of view of social research and policy, there are two interesting questions. First, what was the impact of changes in household size structure (e.g. the increasing share of singles) on the dotted (expected) lines? Second, how can we explain the discrepancy between the solid (observed) and the dotted (expected) lines?

Figure 2 repeats the same analysis for the three Belgian regions, but with a specific focus on household joblessness. This figure underscores the substantial regional disparities in labour markets.

[Figure 2 about here]

In 2012, individual joblessness rates ranged from 33.4 percent in Brussels (a short cut for the Brussels Capital Region) to 27.4 percent in Wallonia to 17.4 percent in Flanders. Looking at changes over time, it is remarkable that in Brussels, individual joblessness rates have not altered over time (one should not forget however that the population of Brussels increased rapidly). In contrast, in both Flanders and Wallonia, individual joblessness rates have substantially decreased, although less so in Wallonia (a 9.5 percentage point decrease compared with a 14.8 decrease in Flanders). Regional individual joblessness rates were very similar in the early 1980s, but diverged in the next 30 years. This divergence in individual employment participation is also reflected at the household level. Household joblessness is 20.1 percent in Brussels, 16.0 percent in Wallonia and 7.5 percent in Flanders. Household joblessness increased in Brussels and Wallonia with 7.8 and 2.4 percentage points; in Flanders it dropped from 7.8 to 7.5 percent. While the evolution at the bottom of the household employment distribution was disappointing, the share of adults in full-employment households increased considerably in Flanders and Wallonia. Just as for Belgium, a meaningful interpretation of these regional trends is only possible through a comparison with the 'expected' household employment.

In 2012, the observed household joblessness was in all regions higher than the expected household joblessness: the gap ranges from 2.5 and 2.7 percentage points in Flanders and Brussels respectively to 4.4 percentage points in Wallonia. However, when we look at trends over time, the evolution of this gap is very similar in Flanders and Wallonia: with respective increases of 5.2 and 4.7 percentage points. The growth in this gap between observed and expected household joblessness is more limited in Brussels, with a 3.0 percentage point increase.

[Figure 3 about here]

Ceteris paribus, the probability of having no adult in employment is higher in a smaller household than in a larger one; the risk of household joblessness decreases with household size. If the share of individuals in smaller households increases, we expect a given rate of individual joblessness to lead to higher household joblessness, all other things being equal. Hence, in this counterfactual approach, the 'expected rate' of household joblessness is a function of both individual joblessness and the size structure of households.

[Figure 4 and Figure 5 about here]

Over the last three decades, an important demographic trend occurred. Figure 4 shows that the proportion of single-adult households has more than doubled; the share of individuals living in couples and bigger households decreased by, respectively, 8.8 and 3.9 percentage points.

This trend emerges in every Belgian region, although at a different pace (see Figure 5). In 2012, the Brussels region has the highest share of adults in single-adult households (33.4 percent), followed by Wallonia (24.7 percent), which in turn has a much larger share of individuals in single-adult households than Flanders (16.7 percent). In all regions, the median household type (by number of adults) remains a couple of two adults, but with shares diverging from 67.3 percent in Flanders to 61.3 percent in Wallonia and 53.2 percent in Brussels.

6. Realities behind non-employment

The share of the working-age population that lives in a jobless household did not decrease over a period of 30 years. This image of general stability, however, hides opposite evolutions within regions. On the one hand, since 1987, household joblessness decreased sharply for individuals over 50 (see Figure 6). On the other hand, household joblessness in age categories younger than 50 did not

decrease at all. Household joblessness and its evolution within age groups differ by region, especially in the age cohort that typically has dependent children. For individuals over 50 household joblessness gradually decreases in each region, with 14 percentage points in Wallonia as well as in Flanders. In Flanders, household joblessness in the age group 20 to 40 is relatively low and stable at around 5 per cent over the entire period. In contrast, household joblessness in Wallonia (and also Brussels) is persistent and much higher. Moreover, it increases in these regions.

[Figure 9 about here]

The sociological phenomenon by which a large group of individuals over 50 are unemployed has changed considerably over the past thirty years. At the beginning of the 1980s, almost 60 per cent of the working-age population lived in a couple where the man was employed and the woman wasn't. During the period of the great industrial restructuring (between 1981 and 1987) a sizeable group of older men lost their jobs[9]. Due to the fact that they were the sole earner within their household, the share of jobless households suddenly increased with 10 percentage points. In a male breadwinner model, with many men but very few women in employment, an economic downturn has an immediate and strong effect on household joblessness. Gauged from the perspective of household joblessness, it took 25 years to digest this wave of male exits from the labour market. In that period, more and more women participated in the labour market and they also stayed longer in the jobs they held.

Figure 7 shows that the age structure of adults in jobless households differs between the regions. Flanders has a relatively large share of its population in jobless households in the age bracket 50-59 when compared to Wallonia and especially compared to Brussels. This suggests that, in explaining polarisation, early exit from the labour market plays a much larger role in Flanders than in the other regions, the presumption being that elderly workers who exit the labour market via pre-retirement typically do so in circumstances where their partner is inactive or has become inactive as well.

[Figure 7 about here]

A corollary of the regional age distribution of adults in jobless households is that adults in age cohorts that typically have dependent children are more affected by household joblessness in Wallonia and Brussels than in Flanders. In Figure 8, we show that, by 2012, considerably more adults with dependent children live in jobless households in Brussels and Wallonia than in Flanders. In Brussels, half of all adults in jobless households have at least one dependent child. In Flanders, the proportion of adults in jobless households with children is one in three.

[Figure 8 about here]

Over a period of 30 years, the proportion of adults in jobless households that have children has significantly decreased in the Flemish region. Both among jobless singles and jobless couples, the share of children has decreased, although among jobless couples this trend reverses during the economic crisis. In Wallonia, the proportion of adults in a jobless household that have dependent children remains more or less the same over the entire period, both for those living alone or in couples. The precarious position of children is most pronounced in the Brussels region. In this region, the share of adults in jobless couples that house children is substantially higher than in other regions (around 70 percent of adults in jobless couples live with at least one child). These findings

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[9] Between 1983 (the start of the LFS data series) and 1987 individual unemployment among men between 50 and 59 increases with 10 percentage points, while in younger age categories it remained unchanged (or even decreases slightly).

corroborate with the interregional difference associated with household employment patterns of households with children, as emphasized by Vandenbroucke and Vinck (2013). In their analysis of the relation between household employment patterns and child poverty in Belgium, they find that children in 'severe work poverty' (an indicator characterizing the labour market participation of households with children, which correlates with household joblessness, see below) is much more prevalent in Wallonia than in Flanders.

[Figure 9 about here]

And also the educational profile of people living in jobless households offers an example of regional disparity. In each region, at least half of all adults living in jobless households (in 2012) have no diploma in secondary education. In Brussels, the educational profile of adults in household joblessness has hardly changed over time. Its jobless households host 50 percent without secondary education and a relatively high share (around 20 percent) of tertiary educated adults. In Flanders and Wallonia, the changes in the educational background of adults in household joblessness have changed rapidly over time, with gradually less medium and high-skilled individuals.

[Figure 10 about here]

The different socio-demographic characteristics of adults in household joblessness in Brussels are (at least partly) associated with their origin. Over the last decade, the proportion of the non-EU15 born population has doubled in Belgium. This evolution is even more pronounced in the working age population. As shown in Figure 10, this demographic change was (initially) most pronounced in the capital region. In 2012, more than 50 percent of adults in jobless households are non-EU15 born in Brussels. In that year, the proportion of foreign-born adults in jobless households is much smaller in Flanders and Wallonia, with respectively 27.2 and 26.2 percent non-native born adults. However, the change over the last 18 years in the proportions of non-EU born adults in jobless households is much stronger in Flanders and Wallonia compared to Brussels[10].

7. The concept of polarisation

Gregg and Wadsworth (2008) propose to use the counterfactual random distribution of jobs over households, introduced in the previous section, to define 'polarisation' in job distribution. Polarisation is the difference between the observed household joblessness and the counterfactual (or 'expected') household joblessness: it is the gap between the solid and the dotted lines for household joblessness presented in Figure 1 and 2. Thus, polarisation measures the extent to which there are more (or fewer) jobless households than expected under the hypothesis of a random distribution of jobs over households, given the national household size structure. The construction and subsequent decomposition of this polarisation index is made possible by the rather crude distinction between jobless households and other households, based on the ILO employment concept; a similar comparison of 'observed' with 'counterfactual' employment patterns would be much more difficult with fine-grained measures of household work-intensity. Formally, this can be written:

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[10] Corluy & Verbist (2015) explore the divergent household work intensity between households with foreign-born working age adults versus those households with only native adults. It appears that the average household work intensity of non-European adults is lower than that of natives, mainly because of precarious individual employment rates of immigrants in Belgium. But despite (very) low individual employment rates, mainly of female immigrants, the current distribution of jobs over households follows a more traditional pattern of negative polarisation.

(1) $$P_{it} = jl_{it} - jl_{it}^{e}$$

P_{it} = level of polarisation in household joblessness in country i in year t
jl_{it} = actual share of individuals living in household joblessness
jl_{it}^{e} = expected share of individuals living in household joblessness in country i in year t

We should emphasize that the expression 'polarisation' does not carry a normative meaning for us. We do not consider the benchmark used to define the concept – a random distribution of jobs over households, given the household size structure – as a normative ideal. In a context of limited job opportunities 'positive polarisation' might be seen as a kind of 'Matthew effect': a concentration of additional advantage (say, a second job for the partner of someone who is already employed) for those who already have some advantage (compared with a household where both partners are jobless); 'negative polarisation' might be appreciated as a form of solidarity, i.e. a fair distribution of scarce employment opportunities. However, we do not suggest that maximally 'negative polarisation', nor the benchmark of 'randomly distributed jobs', serves a normative ideal. The negative polarisation that was typical for the male breadwinner model was neither a sustainable nor a desirable model. Our argument is rather that 'positive polarisation' comes with a social cost: jobless households of working-age people need to be supported by social transfers. If that cost is to some extent avoidable, the welfare state is in a sense in a suboptimal equilibrium.

[Figure 11 about here]

Figure 11 shows polarisation levels by household size. Over the whole period under review, both observed and expected household joblessness are higher in single-adult households than in other households. Despite substantial decreases in observed household joblessness among singles, the decline in expected household joblessness takes place at a far higher pace. This results in growing levels of polarisation within this particular household subgroup over a period of 30 years. In comparison with a rather limited level of polarisation (around 2 percentage points) in 1983, singles in Belgium are currently confronted with a polarisation level of 10.3 percentage points. The evolution in the subgroup of couples is rather similar: the observed household joblessness also diminishes, but the decrease in expected household joblessness is much stronger. During the 1980s the observed household joblessness for couples was lower than what could be expected on the basis of a random distribution of jobs: the male breadwinner model implied -by definition- negative polarisation. In 1983, levels of polarisation in couples were around -2.7 percentage points. Since the early 1990s the relationship between observation and expectation in the couple segment has changed: the level of polarisation first approached zero, and then became positive starting in the mid-nineties. The breadwinner model and negative polarisation of employment in the 1980s is consistent with added worker theories (see Cullen and Gruber, 2000). These theories suggest that the presence of an employed adult in a household with two working age people would reduce the labour supply of other occupants. Indeed, in that period female employment rates lagged significantly behind those of men. However, over a period of 30 years the gender gap in individual employment rates has significantly decreased, from 38.4 percentage points in 1983 to 10.0 percentage points in 2012. In 2012 the level of polarisation in couples equals 1.7 percentage points. Over the last three decades, levels of polarisation increased by 4.5 percentage points.

The polarisation analysis can be decomposed on the basis of household size. The overall level of polarisation is a weighted average of polarisation within each household size subgroup. The combined effect of increasing polarisation in both the single-adult household segment and in the couple segment resulted in an increase in the overall Belgian polarisation level from -1.6 in 1983 to 3.5 in 2012. Given that there are around 5,900,000 working age individuals in Belgium in 2012, our estimates suggest that there are currently around 206,500 extra individuals in jobless households,

compared to what would be expected if employment were distributed at random over households.

[Figure 12 about here]

Figure 12 repeats the same analysis of expected and observed household joblessness by household size for the three regions. Strong regional variation prevails in the levels of and changes in polarisation. In Brussels, levels of polarisation in single-adult households are relatively small. Levels of polarisation in single-adult households are much more pronounced in the two other regions, with very high levels in Wallonia (14.3 percentage points in 2012), which are more than double the level of polarisation in Flanders (6.1 percentage points) and more than three times the level polarisation in Brussels (3.9). Changes in polarisation in this household segment are also most outspoken in Wallonia with an 8.9 percentage point increase, as compared with respectively 6.2 and 1.9 percentage point increases in Flanders and Brussels. In 2012, levels of polarisation in couples are twice as high in Brussels and Flanders compared to Wallonia. In every region there is a trend towards higher polarisation in the subgroup of couples. This change was strongest in Flanders with a 5.5 percentage point increase in 30 years (compared to a 2.5 percentage point increase in Wallonia). Finally, levels of polarisation in households with more than two adults are highest in Brussels, followed by Wallonia and Flanders. Changes in polarisation in this household segment were strongest in Brussels and Flanders.

In the previous paragraphs we have presented household size structure (the distribution of adults by household size) and polarisation levels by household size separately. Polarisation by household size and the household size structure together explain the overall level of polarisation: we integrate them in Figure 13 and Figure 14.

[Figure 13 and Figure 14 about here]

Figures 9 and 10 display levels of polarisation for Belgium and its regions and show the weighted contribution of polarisation levels by household size (weighted by the household size structure). In 2012, 68 percent of national polarisation is due to the weighted contribution of polarisation in single-adult households, while the weighted contribution of polarisation in two-adult households is only 31 percent.

At the regional level, Flanders and Brussels are confronted with similar levels of polarisation, and despite different household size structures and within-household size levels of polarisation, the weighted contribution of polarisation by household size ends up rather similar. Around 45 percent of total polarisation stems from polarisation in single-adult households, weighted by their proportion in the population. The weighted contribution of polarisation in two and three-adult households constitutes respectively 45 and 10 percent of total polarisation. The decomposition of total polarisation is rather different in Wallonia. The relatively high level of polarisation in single adult households (and a substantial proportion of adults living in single-adult households) results in an 81 percent contribution to total polarisation. In strong contrast with Flanders and Brussels, merely 14 percent of total polarisation is due to the weighted contribution of polarisation in couples.

8. Decomposition of changes in household joblessness and polarisation

Observed household joblessness in one country or region at a certain point in time consists of two terms. One is the expected household joblessness (a random distribution of individual non-employment over households) and the other is the level of polarisation (the share of household joblessness that one cannot explain through random distribution of individual joblessness). When we evaluate changes in household joblessness over time, changes can stem from both terms, i.e.

changes in expected household joblessness and changes in levels of polarisation.

The expected household joblessness can evolve because individual joblessness changes over time. But, the expected household joblessness can also change because the household size structure of a population changes. The overall level of polarisation can change because of changes in the level of polarisation in one or more of the household subgroups we distinguish. We refer to this type of change as 'within-household change'. The overall level of polarisation can however also change due to changes in the household size structure; for instance, overall polarisation may increase because the share of adults in a household subgroup where polarisation is relatively higher increases, without any change in the polarisation of that subgroup itself. We refer to this second type of change as 'between-household change'.

Hence, changes in overall household joblessness can be decomposed into four terms: (i) the contribution by changes in individual joblessness that affect the expected rate of household joblessness (for a given household size structure); (ii) the contribution by changes in the household size structure that affect the expected rate of household joblessness; (iii) the contribution by between-household changes, i.e. changes in household structure that impact the degree of polarisation, given subgroup polarisation levels; and (iv) the contribution by within-household polarisation changes, i.e. changes in subgroup polarisation levels.

$$(2) \qquad \Delta jl_i = \sum_{k=1}^{K} \Delta n^k \big[0.5\pi_{k,t} + O.5\pi_{k,t+1}\big] \qquad \text{(i)} \qquad +$$
$$\sum_{k=1}^{K} \Delta \pi_k \big[0.5 n_t^k + 0.5 n_{t+1}^k\big] \qquad \text{(ii)} \qquad +$$
$$\sum_{k=1}^{K} \Delta \pi_k \big[0.5\big(jl_k - n^k\big)_t + 0.5\big(jl_k - n^k\big)_{t+1}\big] \qquad \text{(iii)} \qquad +$$
$$\sum_{k=1}^{K} \Delta\big(jl_k - n^k\big)\big[0.5\pi_{k,t} + 0.5\pi_{k,t+1}\big] \qquad \text{(iv)}$$

with
n   = individual non-employment rate of working-age adults
k   = household size (number of working age adults)
K   = maximal size of households in a country
π_k = share of working-age adults living in a household of size k
jl_k = observed household joblessness rate of working-age adults in households of size k

Figure 15 presents such a decomposition of changes in household joblessness over the period of 1983-2012, both at the national level and at the regional level.

[Figure 15 about here]

We first focus on the national level. As shown in Figure 1 individual employment in Belgium increased by 11.4 percentage points between 1983 and 2012; if today's household size structure would be the same as in 1983 and no changes in polarisation would have occurred, household joblessness would be 6.4 percentage points lower; this is shown in Figure 15 by means of the light blue bar (contribution by changes in individual joblessness). However, the shift towards more single-adult households counteracts the impact of decreasing individual joblessness: it reduces the expected decrease in household joblessness from 6.4 percentage points to around 3.7 percentage points (see the dark blue bar in Figure 15, contribution by changes in the household size structure). Additionally, changes in polarisation occurred over time, due to both 'change within' and 'change between': polarisation increased in all household subgroups and the household size structure shifted towards households with a higher polarisation level. The combined effect of what could be expected, taking into account shifts in the household size structure, and the increase in polarisation (due to both 'within' and 'between' change), is a net increase in household joblessness of 1.5 percentage points (the red diamond in Figure 15). The effect of increasing within-household polarisation is

substantially larger than the expected changes in household joblessness.

We now turn to the regional level. Household joblessness remained almost stable in the Flemish region; in Brussels and Wallonia, household joblessness increased, respectively, by 7.8 and 2.4 percentage points (see the red diamonds in Figure 15). Figure 15 shows that in Flanders and Wallonia, household joblessness rates should have fallen, given diminishing individual joblessness in both regions (light blue bars). This was counteracted by a demographic shift towards smaller households, which was however less prominent in Flanders than in the other regions (dark blue bars). In Wallonia, half of the impact of decreasing individual joblessness is counteracted by an increasing proportion of single-adult households. In Flanders, close to one quarter of the decline induced by the increase in the individual employment rate is offset by a decreasing household size. In Brussels, there was no substantial improvement in individual employment rates over the last 30 years. Here, a quick shift towards smaller households exerted strong upward pressure on the expected change in household joblessness (about 3.5 percentage points).

Finally, Figure 15 shows the impact of polarisation. In Flanders and Wallonia, the contribution of changes in polarisation is more important than the impact of the shift to smaller households. Most of the divergence between individual and household joblessness stems from an increasingly skewed distribution of employment over households. Changes in polarisation mainly occur within household size types, rather than between household sizes.

9. Explaining polarisation: conditional randomization of individual risks

Polarisation is the cardinal difference between the actual household joblessness and a counterfactual household joblessness, based on a random distribution of individual joblessness over households. This counterfactual household joblessness can be refined. Instead of using a random distribution of the individual joblessness of a country or region, one can take into account specific observable traits of individuals that are known to influence both household formation and labour market participation. This allows us to explore the impact of individual characteristics on polarisation.

The concentration of joblessness in certain households may be due to the combination of two factors. First, individual characteristics influence the risk of individual joblessness. Lower education, older age or non-European origin, for example, all translate into a higher risk of individual joblessness. Second, it is possible that household members share common characteristics. In this case we speak of assortative mating or homogamy. If adults with similar characteristics live together, differences in individual risks will be amplified at the household level.

In this section, we construct a variety of conditional counterfactual household joblessness rates. These conditional household joblessness rates allow individual joblessness risks to vary on the basis of: gender, age (three groups: 20-29, 30-49, 50-59), education[11] (three groups: no primary education, at most secondary education, at least tertiary education) and region (Brussels, Flemish region, Walloon region). We predict conditional counterfactuals using one trait at a time and then predict counterfactuals based on the interaction of all four characteristics; conditional polarisation is the difference between these conditional counterfactuals and what we observe in reality. Figure 16 displays indicators of conditional polarisation, for the whole population and for two household subgroups (singles and couples).

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[11] Because information on the highest attained ISCED level of all respondents in EU-LFS is only gathered from 1992 onwards, we confine the conditional analysis of polarisation to the period of 1992-2012.

[Figure 16 about here]

The better the prediction of household joblessness by taking into account individual characteristics, the closer the conditional counterfactual will be to the observed reality, i.e. the lower the level of conditional polarisation. Hence, to assess the contribution of a specific characteristic to polarisation, one should compare the 'unconditional polarisation' level (the counterfactual household joblessness based on household size only) with various 'conditional polarisation' levels (see Gregg et al., 2012). The 'explanatory power' of a characteristic with regard to polarisation is the difference between unconditional polarisation and conditional polarisation (conditional on that characteristic), expressed as a proportion of the unconditional polarisation.

When interpreting Figure 16, one should bear in mind that for singles the concept of polarisation is no more than the absolute difference between the individual joblessness rate for singles and the individual joblessness rate for the whole population. Therefore, changes in the explanatory power with regard to polarisation in this household subgroup are directly related to changing profiles of single adults. In couples, the extent to which individuals with similar characteristics tend to live together also plays a role in the evolutions shown in Figure 16.

First, we allow for gender-specific joblessness rates. In 2012, gender-specific individual joblessness hardly offers any explanation for the level of polarisation: only 2 percent of polarisation is related to gender differences in individual joblessness. Indeed, when individual joblessness is rather similar for men and women, the conditional counterfactual household joblessness rate on the basis of gender equals the unconditional counterfactual, and no explanation for polarisation is found on the basis of this characteristic. Thirty years earlier, the difference in individual joblessness between men and women amounted to 38 percentage points. In 1983, polarisation was negative, with gender explaining more than 100 percent of this phenomenon. The fact that, by 2012, gender offers very little explanation for the (positive) polarisation of 2012, implies that gender (i.e. the convergence of individual risk profiles of men and women) contributes importantly to the explanation of changes in polarisation between 1983 and 2012.

When we construct a counterfactual conditional on education (i.e. when we allow individual joblessness to vary on the basis of education), we observe a declining trend in the explanatory power of education with regard to polarisation. In 1993, around 30 percent of the total level of polarisation was related to educational differences. In 2012, those differences only account for 15 percent of total polarisation. Over this period of 20 years, no changes occurred in individual risk profiles of education subgroups. Individual joblessness rates of poorly educated adults freeze around 40 percent, while those of adults educated at the tertiary level stay fixed at 11 percent. These stable individual employment rates over education mean that it is it likely that changes in the explanatory power of education are related to changes in assortative mating (among couples) or with changing profiles (among singles) over this characteristic. When we compare the explanatory power of education for polarisation among singles and couples, differences emerge over these household size subgroups. In single-adult households, conditioning on education increases the explanatory power of this characteristic over time (from around 3 percent to 20 percent). In couples, conditioning over education decreases the explanatory power over time (from almost 60 percent to 10 percent). Because no changes are observed in the individual joblessness risks over education groups, the changing explanatory power in single-adult households is related to an increasing share of higher risk profiles (i.e. lower educated singles). In 2012, adults living alone have a 7 percentage point higher probability of being low-skilled compared to the entire Belgian population. However, in 1993, the educational profile of singles was identical to that of an average adult. Keeping the educational profile of singles constant over time would have resulted in an 8 percent point lower household

joblessness level in 2012 than observed. In couples, one can observe that assortative mating has decreased[12]. Due to the global increase in average educational levels, the proportion of homogeneous non-educated couples declined and the proportion of 'mixed educational' couples increased.

The region of residence is an observable trait of individuals which implies assortative mating by definition: members of a household always share their residence. Although this instance of assortative mating is by definition constant over time, its explanatory power for polarisation has increased from around 8 percent in 1993 to 13 percent in 2012. This small increase is driven by diverging individual joblessness over regional subgroups. In a cross-country comparison, 13 percent is rather high: in other European countries with similar levels of polarisation the explanatory power of region is less important than in Belgium. This is not only related to substantial differences in regional joblessness rates but also to the different demographic composition of the Belgian regions.

Finally, we use the interaction of all traits together (gender, age, education and region) to estimate a conditional counterfactual household joblessness rate. Although the importance of these traits in explaining levels of polarisation separately is rather small (13 percent explained by region is not much *per se*, even if the percentage is higher than elsewhere) a substantial proportion of total polarisation in 2012 is explained by combining these characteristics. Around 33 percent of polarisation is due to variations of individual joblessness over gender, age, education and region. In single-adult households almost 40 percent of polarisation is explained through the combination of these characteristics. In couples around 25 percent is due to differences in individual joblessness risks and the sharing of common characteristics at the household level. However, there remains a substantial within-group component to the household joblessness rate that cannot be explained by these factors. This unexplained proportion is larger among couples.

Between 1993 and 2012, conditional levels of polarisation rose by only 0.9 percentage points, while the unconditional level of polarisation increased by 2.2 points. Hence, the gap between the unconditional and the conditional indicators increases, which means that the explanatory power of the individual characteristics used to calculate the conditional polarisation increases (see our definition of 'explanatory power', supra). In yet other words, the unconditional polarisation which we calculate is increasingly driven by the individual characteristics of adults, both in single-adult households and couples. Over the last 20 years, the explanatory power of the *interaction* of age, gender, education and region rose from merely 3 percent to 30 percent. To understand the interaction effect, one should note that (rather stable) net individual joblessness risks on the basis of one characteristic can hide opposite trends. For example, young low-skilled individuals (20-29) are struggling with decreasing labour market opportunities (with individual employment rates of this

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[12] To quantify the impact of assortative mating (over education) on levels of polarisation in couples we compare observed and expected educational profiles of individuals living in couples. We define 'expected educational profile' as a random distribution of individual education levels in a country over couples. Assortative mating prevails over all educational levels. We observe much more homogeneous couples (with the same levels of education) than expected in a random distribution, independent of the level of education. In 1992, assortative mating over educational levels was also prevalent. Over time however, the overrepresentation of couples with tertiary education increased, at the expense of the overrepresentation of poorly educated couples (5.4 percentage point change over time). In 2012, the proportion of adults with tertiary education living together in a couple is 14 percentage points higher than expected from a random distribution of educational profiles. In the same year, around 5.3 percent more individuals live in a couple with low education than expected from a random distribution. To estimate the effect of assortative mating on changes in household joblessness, we keep the 1992 levels of assortative mating fixed over time. Among couples, household joblessness in 2012 would be around 4 percentage points higher if no changes in assortative mating had occurred.

subgroup decreasing from 76 percent in 1992 to 58 percent in 2012), while older low-skilled individuals have seen an improvement in their labour market position (with employment rates of this increasing from 37 percent to 53 percent over the same period). Allowing individual joblessness rates to vary over four traits is effective in introducing these variances into the analysis of conditional polarisation.

10. Cross-country differences in household joblessness

In this section we look at cross-country differences in the levels of household joblessness and polarisation. This comparative analysis in a European perspective is based on LFS 2012 data with 24 European Union countries[13]. It is not straightforward to compare levels of household joblessness between countries and understand the differences. European countries differ significantly with regard to the underlying factors, such as the individual joblessness rates, household structures and levels of polarisation. In this section, we explore the reasons for the relatively high levels of polarisation in Belgium, compared to other European countries.

While the bulk of all working age adults in Europe live in a couple (on average 56 percent in the EU24), we observe strong variation in the share of adults in smaller and larger households (Figure 17). Countries with a weak welfare system, a late transition to adulthood and strong family ties (like Southern European countries and new Member States), show a relatively high proportion of households with more than two adults. In Romania, more than 38 percent of working adults live with at least three working age adults under the same roof, while only 10 percent of all adults live in a single-adult household. This incidence is significantly lower in other countries. In Germany the proportion of adults in a single-adult household (28.5 percent) is much higher than the share of adults in households with at least three adults (13 percent).

[Figure 17 about here]

Figure 18 compares individual and household measures of employment. With regard to individual joblessness, Belgium performs slightly better than the EU24 average (1.4 percentage points difference, on the basis of the data we use in Figure 17). However, when the country ranking is based on the share of individuals in jobless households, only four countries (Lithuania, Spain, Greece and Ireland) perform worse than Belgium. Countries with individual employment rates similar to Belgium succeed in keeping significantly larger proportions of working age adults out of household joblessness.

[Figure 18 about here]

Figure 18 suggests that the level of polarisation is high in Belgium. This is indeed the case, as shown in Figure 19, which presents overall polarisation and polarisation in household subgroups. Belgium, Lithuania, Bulgaria and Ireland display the highest level of polarisation, above 3.5 percentage points. In Malta, Italy and Luxemburg polarisation is negative. In all Southern-European welfare states, in some new Member States (Malta and Estonia) and in Luxemburg, negative polarisation rates are observed in the subgroup of couples. This negative polarisation among couples is consistent with theories on the gender division of non-employment and also occurred in Belgium during the 1980s. In single-adult households, polarisation of employment ranges from negative values in Southern European welfare states (-7 percentage points in Italy) to around 10 percentage points in the United

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[13] Scandinavian countries are excluded from the analysis because no household information is available in the LFS data of those countries.

Kingdom, Belgium and Ireland. In households with at least three working age adults in Southern-European countries, Bulgaria, Romania, and Ireland, one can observe high levels of polarisation.

[Figure 19 about here]

Figure 20 presents a decomposition of the differences in household joblessness between Belgium and all other EU23 countries. The results of this decomposition, for which Belgium serves as a benchmark, can be related to well-known clusters of welfare states, at least to some extent. Esping-Andersen defined welfare state clusters initially on the basis of decommodification; later (1999: 72) he brought the family into play and defined clusters in terms of 'the ways in which welfare production is allocated between state, market and households'. The average household size varies significantly among European countries. This is to a considerable extent due to the late (and still rising) age of exit of young adults from their parents' home in Southern and most New Member States. Countries in the continental cluster (to which Belgium belongs) have similar household size structures. Thus, a certain correspondence exists between the geography of welfare regimes and the geography of average household size (Hank, 2007).

Figure 20 shows that both differences in household size structures and differences in individual joblessness contribute substantially, *ceteris paribus*, to differences in household joblessness between countries. However, with Belgium as a benchmark, these contributory factors sometimes work in an opposite direction. Belgian individual employment rates are average in a European perspective, but significantly higher than in Southern European countries and most New Member States. Thus, differences in expected household joblessness (which is the result of individual joblessness and household size structures) between Belgium and those countries are mitigated. In addition, there is the impact of polarisation: figure 20 illustrates that polarisation in Belgium is higher than in all other countries, with the exception of Ireland and Bulgaria. Countries in Esping-Andersen's 'conservative' cluster (AT, NL, DE, FR) have lower individual joblessness than Belgium, while household size structures are rather similar. But especially within-household polarisation is high in Belgium. In comparison with all other European countries (with the exception of Ireland and Bulgaria), Belgium scores much higher in within-household polarisation. Polarisation thus contributes to the comparatively poor performance of Belgium with regard to household joblessness.

[Figure 20 about here]

To better understand this high level of polarisation in Belgium, in the remainder of this section we confine the international comparison to six countries with more or less the same household structure but different levels of polarisation. We compare Belgium with Germany, France and the Netherlands, neighboring countries with relatively low levels of polarisation, and with Ireland and the UK, which have high levels of polarisation. We apply a logistic regression to examine underlying causal factors; this regression analysis complements an analysis on the concept of 'conditional polarisation', as it was already explained in section 9. Therefore, we return to 'conditional polarisation' at the end of this section.

The regression aims to identify different factors explaining household joblessness; we thereby distinguish between singles and couples. With regard to singles, three factors are at play. First, it is possible that singles, irrespective of their gender, age, education, origin or the region where they live, run a higher risk of individual joblessness than people who do not live alone. Second, it is possible that the characteristics of singles in terms of gender, age, education, origin or the region where they live, make them more vulnerable to joblessness, irrespective of the fact that they are singles. Third, it is possible that the gap in individual joblessness between people with relatively strong and people with relatively weak individual profiles (in terms of gender, age, education, origin

and region), is larger in Belgium than in other countries; we can measure this gap by the variance in individual joblessness across subgroups defined by age, education, gender, origin and region. This third factor can also explain cross-country differences in household joblessness in couples, together with the degree of homogamy in couples. When adults with similar characteristics live together, a concentration of 'good' and 'bad' risks develops in households which leads, *ceteris paribus*, to higher household joblessness. If the variance in individual joblessness risks is the same, but in certain countries homogamy within couples is stronger, polarisation will again be larger in the latter countries. Hence, the degree of homogamy is the fourth factor which can explain differences in levels of polarisation.

[Table 1 about here]

We start the international comparison with a logistic regression to determine the probability of individual joblessness in the six countries under review (and the Belgian regions), after controlling for gender, age, education, origin and household size. In Table 1 we present the marginal effects for these explanatory variables. First, we find that when we control for gender, age, education and origin, the joblessness risk for singles is greater than for non-singles. This is the case in all countries, but the contribution of 'being single' (after controlling for other individual characteristics) to the joblessness risk is lowest in Germany and France. In Belgium, the probability of joblessness increases with 9 percentage points when one lives alone (after controlling for other individual characteristics), but this effect strongly differs between the regions. In the Netherlands, the marginal effect of being single on the joblessness risk is largest, with 10 percentage points. Even though the joblessness risk of singles differs between those six countries, it is not the driving force behind the comparatively high level of polarisation in Belgium. The second factor, the socio-demographic profile of singles, plays a much bigger role, notably in the comparison with Germany, France and the Netherlands.

[Table 2 about here]

Table 2 shows that in Belgium, more than in other countries, many singles have a 'weak profile', which increases their risk of joblessness: there is an overrepresentation of individuals with low skills, individuals of non-European origin and older persons, compared to the average Belgian population. There is a similar overrepresentation of low-skilled and older individuals among singles in Ireland and the UK; Ireland and the UK also have more women among the singles' segment. In Germany, France and the Netherlands the profile of singles hardly differs from that of the total population.

Thirdly, the logistic regression in Table 1 shows that the net impact of gender, age, education and origin, after controlling for the fact whether one lives alone or not, is much greater in Belgium than in Germany, France and the Netherlands, which are the low polarisation countries in the subset under review here. Table 3 presents data which corroborate this observation.

[Table 3 about here]

Table 3 indicates that the standard deviation[14] in individual joblessness between young and older adults is nowhere as big as in Belgium (the spread is identical in Flanders and Wallonia). Belgium also leads in the spread of individual joblessness over origin; this gap is most prominent in Flanders. Additionally, with the exception of Ireland, in no other country are the differences in joblessness between the low-skilled and high-skilled as big as in Belgium. Even if in Belgium and in other

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[14] Standard deviation is a measure for the spread, the degree to which values differ mutually, of a variable (or a distribution). Standard deviation is defined as the root from the variance. The variance measures the average of deviations of the different values to the average.

countries the profile of singles would be comparably weak and even if the degree of homogamy in couples would be identical, the much stronger variance in individual joblessness risks in Belgium, compared to those other countries, creates an upward pressure on polarisation.

Finally, Table 4 presents data on the degree of educational homogamy[15] in couples. There is no other country where the low-skilled cluster so strongly in couples as in Belgium. When we focus on the degree of homogamy of the high-skilled, Belgium scores in the same order of magnitude as Ireland and the UK and somewhat higher than France, the Netherland and Germany.

[Table 4 about here]

The previous analysis identifies different factors that contribute to a high level of polarisation in Belgium. As already explained in section 9, the concept of 'conditional polarisation' also allows to quantify the impact of these factors on the level of polarisation. Instead of using a random distribution of individual joblessness in a country or region, conditional polarisation takes the individual characteristics of persons into account. To understand the contribution of a certain characteristic on the level of polarisation, we must compare conditional polarisation with total polarisation. This can be done for each of the countries under review. In this way, we can compare the explanatory power of individual characteristics with regard to polarisation across countries.

[Figure 21 about here]

Figure 21 compares polarisation levels in Belgium, the Belgian regions, Germany, France, the Netherlands, Ireland and the UK. We show for each of these countries an index of unconditional polarisation, calculated on the basis of a random distribution of individual joblessness, in the left bar. We show conditional polarisation after correcting for gender, age, and education, in the second bar. For all countries, except for Germany[16], we add conditional polarisation after controlling for gender, age, education and origin (third bar). For Belgium, Ireland and the UK we also look at conditional polarisation after correcting for gender, age, education and region (fourth bar). In the fifth bar, we show levels of conditional polarisation after controlling for gender, age, education, origin and region: this exercise is only possible for Belgium and the UK.

In all the countries presented in Figure 21, polarisation is very high in the segment of singles. In the Netherlands, even 90 percent of polarisation occurs in this household segment. The fact that someone is single, controlled for gender, age, education, region and origin, leads to a higher risk of joblessness. In countries with relatively low polarisation, conditional polarisation based on a combination of individual characteristics seems to have only very weak explanatory power. In these countries the differences in individual joblessness risks between people with weak and strong profiles are rather limited. In the same countries, singles do not have a deviating profile compared to the rest of the population. Hence, the level of polarisation in Germany, France and the Netherlands can be explained exclusively by sociological differences in labour market participation between singles and individuals living in couples, irrespective of the characteristics of these individuals or their households. On the other hand, in countries with high polarisation (BE, UK and IE), polarisation decreases considerably when we control for gender, age and education. In these countries individual joblessness risks differ relatively strongly by individual characteristics for which we control, and in Belgium these differences seem to be strongest for gender and age. On the basis of these three

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[15] We divide the observed deviation of individuals' educational levels with the expected distribution of educational levels within couples, on the basis of a random distribution of educational levels of men and women. The cardinal difference between observed and expected distribution we call homogamy (see Table 4).
[16] In the German LFS the variable 'country of birth' is not available.

characteristics we can explain 19 percent of polarisation in the segment of singles in Belgium. This explanatory power is also linked to the relatively greater share of low-skilled individuals in the singles' segment. In Ireland and the UK we can explain respectively 36 and 22 percent of polarisation in the segment of singles. It is remarkable that the addition of origin or region to conditional polarisation does not increase the explanatory power in Ireland and the UK. In these countries, the spread in individual joblessness risks and weak profiles can be mainly explained by differences in educational levels. In Belgium, though, these differences increase when we add region and/or origin to conditional polarisation. In Belgium joblessness risks by individual characteristics differ much stronger between the regions and between different origin groups. Conditional polarisation by gender, age, education, origin and region explains 36 percent of total polarisation in Belgium.

11. Polarisation, relative severity of work-poverty, and poverty

Income poverty is typically measured on a household basis: the at-risk-of poverty indicator that is most often used counts the number of individuals living in a household that has a standardized net disposable household income below a poverty threshold. In all European welfare states there is an unambiguous and systematic negative correlation between at-risk-of-poverty rates of individuals and the work intensity of the household to which they belong (Vandenbroucke and Diris, 2014, pp. 16-17; European Commission, 2012, Chapter 2). 'Household work intensity' is a fine-grained indicator of household employment, which Eurostat defines as the ratio of the total number of months worked by working-age household members to the total number of months that they could, in theory, have worked[17]. For persons who reported having worked part-time, an estimate of the number of months in terms of full-time equivalents is computed on the basis of the number of hours habitually worked at the time of the interview.

Hence, the work intensity of the household to which an individual belongs is a crucial factor in explaining his or her poverty risk. When the analysis shifts from the individual level to the level of welfare states and cross-country comparisons, it seems a logical presumption that national poverty rates correlate with household employment indicators rather than with individual employment indicators. In fact, the reality is more complex. Contrary to what one might expect, Corluy and Vandenbroucke (2014, 2015) show that, in a cross-country analysis, household joblessness correlates much *less* with non-elderly (or child) poverty rates than with individual joblessness. In contrast, pre-transfer poverty correlates with both household joblessness and individual joblessness. Intuitively, one might understand this as follows: welfare states do compensate for high levels of household joblessness by means of social transfers; welfare states with high levels of individual employment seem more committed and/or more successful in doing so.

Understanding the relationship between national poverty rates and household employment rates requires a more subtle analysis than simple bivariate correlation as well as a more fine-grained metric than 'joblessness' vs. 'employment'. Vandenbroucke, Diris and Verbist (2013) distinguish three indicators of the household employment record of welfare states, on the basis of the Eurostat work intensity metric. The first indicator is the share of individuals in households with very low work intensity (less than 20%); these households are labeled as 'very work-poor'. The second indicator is the share of individuals in households with medium work intensity or less (i.e. 55% or less); these households are labeled as 'work-poor'. The third indicator is the share of individuals in very work-poor households *within* the subgroup of individuals in work-poor households; this indicator is labeled 'the relative severity of work poverty'. Intuitively, the latter indicator seems to correspond to a

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[17] When work intensities are calculated, all individuals in a specific age bracket (e.g. 20-59) are considered to be of 'working age', except students, who are excluded from the calculation.

notion of 'polarisation of jobs over households': when a welfare state is characterized by a comparatively high 'relative severity of work poverty' in its households, labour market participation seems distributed across households in a skewed way (in comparison with other welfare states). This is an observation, which, *prima facie*, signals a phenomenon of 'polarisation' of jobs over households.

Vandenbroucke, Diris and Verbist (2013) examine different regression models explaining child poverty and non-elderly poverty in the second half of the 2000s on the basis of patterns of employment in European welfare states. They tested the explanatory power of individual employment rates, the share of individuals (either children or non-elderly individuals, depending on the poverty analysis at hand) in work-poor households, the share of individuals (idem) in very work-poor households and the 'relative severity of work poverty' (together with the level and architecture of social spending). It turns out that combining the share of individuals in work-poor households and the 'relative severity of work poverty' as separate independent variables yields the best fit[18]. These results suggests that one should study the country-specific distribution of household work intensity over the population, and that the concentration of individuals in very work-poor households does play an independent role, next to the total share of individuals in work-poor households (see also Vandenbroucke and Diris, 2014).

This research illustrates that the relationship between income poverty and household employment patterns is complex. However, it simultaneously shows that polarisation, as we define it, is indeed relevant to understanding welfare states' performance with regard to poverty. For sure, the 'relative severity of work poverty' indicator applied in this research differs from the polarisation index calculated in this paper in two respects[19]. First, the underlying definitions of employment are different (a binary ILO-concept of employment/non-employment in the case of polarisation, versus the fine-grained Eurostat metric of household employment underpinning 'relative severity of work poverty'). Second, the polarisation index is based on a contrast between observations and a counterfactual, whilst the 'relative severity of work poverty' is simply based on a ratio between observations. However, these indicators correlate with each other in an interesting way. Table 5 puts this into perspective, by presenting the correlation between eight different employment indicators for 28 European welfare states, all based on SILC 2011 and calculated for the working age population between 20 and 59 years old (excluding students): (1) the individual joblessness (i.e. the individual non-employment rate based on the ILO concept of employment); (2) the observed household joblessness; (3) the ratio of observed household joblessness to individual joblessness (i.e. the ratio of indicator 2 to indicator 1); (4) the counterfactual household joblessness underpinning the polarisation index; (5) the polarisation index; (6) the share of individuals in work-poor households; (7) the share of individuals in very work-poor households; and (8) the relative severity of work poverty (i.e. the ratio of indicator 7 to indicator 6).

[Table 5 about here]

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[18] We should stress that this conclusion holds for the pooled time series regression over the whole period. It does not hold for a 'naïve' regression that is, for instance, limited to SILC 2011. In a simple regression applied to SILC 2011, with child poverty as dependent variable, and (i) the share of children in work-poor households, (ii) the relative severity of work poverty, and (iii) the share of transfers and pensions in household incomes of children as independent variables, it appears that only the share of children in work-poor households has a significant impact. In EU SILC 2011, the bivariate correlation coefficient with child poverty is 0.56 for the share of children in work-poor households, 0.24 for the share of children in very work-poor households, -0.15 for the relative severity of work poverty, and 0.01 for spending. The fact that 2010 was a year of deep crisis explains this result (in contrast to the result of a pooled time series regression over the whole period).

[19] We also use a different database in the previous sections for the calculation of the polarisation index, namely LFS. In this section, we use the same database for comparing both concepts, namely SILC.

As shown in Table 5, individual joblessness (indicator 1) correlates strongly with the share of individuals in work-poor households (indicator 6), while household joblessness (indicator 2) correlates strongly with the share of individuals in very work-poor households (indicator 7). The latter observation is not so surprising, but the first observation – which establishes a rather close match between an individual employment indicator and a household employment indicator – needs more explanation than we can deliver here. However, the combination of these two observations explains why the two ratios which we construct on the basis of these data (our indicator 3, observed household joblessness on individual joblessness, which is the ratio of 2 to 1, and our indicator 8, the relative severity of work poverty, which is the ratio of 7 to 6) also correlate strongly with each other. In addition, *both* the relative severity of work poverty and the ratio of observed household joblessness to individual joblessness correlate strongly with our polarisation index. Figure 22 visualizes this.

[Figure 22 about here]

In yet other words, it seems that our measure of polarisation is indeed relevant as a corollary of the relative severity of work poverty indicator, which is in turn a significant variable in the poverty analyses mentioned earlier[20]. The relative severity of work poverty is based on simple direct observations; polarisation introduces more analysis, since it is based on a deviation from a 'counterfactual' and thus points to sociological, cultural and economic factors at work in labour markets and households. The correlation between the two indicators and their role in poverty analyses underscores the importance of further research on polarisation.

Before concluding, we add a final thought on the link between our analysis and the abundant literature on 'in-work poverty', i.e. the prevalence of 'working poor' in contemporary welfare states. The notion of 'work-poor households' to which we refer in this section, must not be confused with the notion of 'working poor' or 'in-work-poverty'. In the literature on 'working poor', an individual is considered to be 'working poor', when he/she is working but (financially) poor; thereby, 'working' is defined on a minimal basis (e.g. being in employment in the period just before the survey, even if the number of hours worked is very limited). Hence, the 'working poor' concept mixes observations at the level of the individual (is he/she employed or not employed?) with observations at the level of the household to which he/she belongs (what is the *household* income?). This makes it an intrinsically difficult concept, often leading to unwarranted conclusions. However, being considered 'working poor' is not unrelated to the concept of work intensity: 'working poor' individuals often belong to households with low work intensity. In these cases, they are, individually, counted as 'working poor' because of the limited work intensity of the household to which they belong; this may be the consequence of the fact that they work only irregularly or part-time, and/or of the very limited labour market participation of *other* household members (Marx and Nolan, 2014). So conceived, the line of research we pursue here -which explores household employment patterns-may also contribute to a better understanding of the popular but difficult concept of 'working poor'.

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[20] Decomposition as we apply it in this paper with regard to polarization can also be applied to measures on the basis of household work intensity. For instance, Vandenbroucke and Vinck (2013, section 6) decompose the differences between Belgium and other countries with regard to the relative severity of work poverty (for households with children) into differences explained by the relative share of children living with lone parents, differences explained by the relative severity of work poverty within the group of lone parent households, and differences explained by the relative severity of work poverty in other households (and a fourth contributory factor). They find that differences in household size structure explain only a small portion of the differences in the relative severity of work poverty between Belgium and other countries.

12. Conclusions and questions for further research

Individual-based and household-based measures of joblessness offer conflicting signals about labour market performance. In Belgium, individual joblessness fell continuously since the early 1980s while household joblessness remained fairly stable and even increased slightly. However, understanding the relationship between individual and household employment rates is far from evident. By exploring the Belgian data, this paper aims to shed light on some *caveats*, difficulties and possible pitfalls in our understanding of the relationship between patterns of individual and household employment.

If we rank adults on the basis of the employment situation of their household, in 1983 the median adult belongs to a 'mixed-employment household'; from 1991 onwards, the median adult belongs to a 'full-employment household'. This evolution illustrates the rapid change from a male breadwinner model to a dual earner model. However, the spectacular increase in the share of individuals in 'full-employment households', is, first of all, the mathematical corollary of the substantial rise in individual employment rates: it is what one would expect if (a growing number of) jobs would have been distributed randomly across Belgian households. The question is: to what extent can the discrepancy between household and individual employment *not* be explained by the mathematics of random distributions? This question underscores the relevance of the polarisation concept as defined by Gregg and Wadsworth (2008). This index is based on a counterfactual (or 'expected') household joblessness rate, i.e. the rate that would occur if jobs were randomly distributed in the population, given the specific household size structure in the country under examination.

The 'expected rate' of household joblessness is a function of individual joblessness and household size structure. The combination of an improving individual employment rate and a narrowing average household size would have led to a drop in the expected household joblessness rate with 3.7 percentage points. However, observed household joblessness has slightly increased in Belgium. In 2012, the observed household joblessness is in every region higher than the expected household joblessness: the gap ranges from 2.5 and 2.7 percentage points in Flanders and Brussels respectively to 4.4 percentage points in Wallonia. However, when we look at trends over time, the evolution of this gap is strongest in Flanders, where it increased by 5.2 percentage points. Changes over time in Wallonia are also substantial, with a 4.7 percentage point change over 30 years. The growth in polarisation is more limited in Brussels, with a 3.0 percentage point increase.

Polarisation of jobs can be decomposed on the basis of household size subgroups. Polarisation is much higher in single-adult households than in other households. (Brussels constitutes an exception in this respect, with limited polarisation in single-adult households and larger polarisation in households with at least three working-age adults). A decomposition of the overall level of polarisation in 2012 leads to the following result: 62 percent of overall polarisation in Belgium is due to the weighted contribution (weighted by household size) of polarisation in single-adult households; the weighted contribution of polarisation in two-adult households is only 31 percent. Also here, regional diversity prevails. In Flanders, almost half of polarisation is due to the weighted contribution of polarisation in couples. In Wallonia, on the contrary, 81 percent of total polarisation is a result of the weighted contribution of polarisation in single-adult households.

Hence, the standstill in household joblessness is the combined effect of what could be expected on the basis of changes in individual employment, shifts in household size structure, and an increase in polarisation. The increasing polarisation itself can be decomposed into the contribution by 'change within households' as well as the contribution by 'change between'. The total expected decrease in household joblessness of 3.7 percentage points is undone by increasing within-household polarisation. In both single adult households and couples we observe growing levels of polarisation. Within these household groups, changes in polarisation are similar, but at the country level, the

weighted contribution of changes in polarisation in couples is most important. This is another way of saying that the male breadwinner model faded away. The contribution of changes among couples to total polarisation was most important in Flanders. In the Walloon region, both the absolute and weighted contribution of changes in polarisation in single adult households is much bigger than in the other regions.

The notion of expected household joblessness can be refined by taking into account observable traits of individuals that influence both household formation and labour market participation, such as gender, age, education and the region where they live. These observable traits are used to calculate 'conditional expected household joblessness' and 'conditional polarisation'; this allows to measure the impact of individual characteristics on polarisation.

Conditioning by gender, age, education, origin and/or region shows the impact of specific individual risk profiles (among singles and couples) and assortative mating (among couples) on the overall level of polarisation. Changes in the explanatory power of individual traits for polarisation are related to (a) changing risks in individual joblessness, (b) changing profiles of single-adults or (c) changing levels of assortative mating. In 2012, around 15 percent of polarisation is explained by individual differences in education and region. Gender explains merely 2 percent of the level of polarisation. However, this analysis highlights that gender is the main driver of the *evolution* of polarisation, because of the increasing feminisation of the labour market. In 1992, conditional polarisation by gender was higher than unconditional polarisation (i.e. expected household joblessness was lower in 1992, when we differentiate joblessness risk on the basis of gender). By 2012, conditional polarisation by gender equals unconditional polarisation (i.e. the 'conditional expected' – by gender – and the unconditional expected household joblessness are more or less the same). Feminisation of employment rather than more assortative mating (more 'homogamy') explains the trend. The strong explanatory power of gender for the evolution of polarisation also translates into an increasing explanatory power, for the level of polarisation, of the interaction of age, gender, education and region, from only 3 percent in 1993 to 30 percent in 2012.

What we label 'polarisation' in this analysis is driven, in part, by the well-known fact that singles and lone parents are typically less employed than other adults. The explanatory power of individual traits for levels of polarisation is stronger in single-adult households than in couples. The reason is that individual risk profiles of singles differ more strongly from the average characteristics of the Belgian population than the individual risk profiles of people living together. However, when we focus on the evolution over time, the weighted contribution (weighted by household size) of the increasing polarisation in couples is most important.

The decomposition of overall polarisation levels in 2012, shows that the weighted contribution of polarisation in single-adult households in Western-European countries ranges from very low in new European member states (for example 11 percent in Slovakia) to 48 percent in the UK and Austria and 90 percent in the Netherlands. In Southern Europe, polarisation in three-adult households exerts an upward pressure on total levels, but this is counteracted by negative levels of polarisation among single adults and couples. The net contribution of polarisation in two-adult households varies between European countries; but it is never higher than 50 percent, despite the fact that couples remain the dominant household type throughout Europe.

Comparing Belgium with other countries having a similar household structure (DE, FR, NL, IE en VK), yields the following observations. Individual employment in Belgium is relatively low, compared to those countries. We can therefore expect that Belgium also has a relatively high household joblessness level, even with a 'random' distribution of the available jobs over households. In reality, the distribution of jobs over households is not a 'random' distribution. It turns out that singles in the countries under review are more often jobless than people who share a household with others. By definition, unemployed singles constitute a jobless household; in itself, this explains why household

joblessness is frequent in singles. However, in Belgium, the concentration of household joblessness in the segment of singles is exacerbated by two factors. First, compared to the total population, Belgian singles are more often low-skilled, born outside of the European Union, and older. Second, the difference in joblessness risks between individuals with 'strong profiles' and individuals with 'weak profiles' is large in Belgium (both for singles and individuals in other households). In no other country is the difference between the joblessness risk of a young and an older adult or between a person born in the host country and a non-European immigrant as large as in Belgium. Moreover, these differences are enhanced by the regional factor. In no other country is the gap between the unemployment risk of a low-skilled individual in one part of the country and the unemployment risk of a high-skilled individual in the other part of the country as large as in Belgium.

Today's high level of household joblessness in Belgium is mainly due to the relatively bad position of singles, which is associated with the variance in individual joblessness risks. But the variance in individual risks is amplified in the segment of couples, because Belgian couples are relatively homogeneous with regard to the education of the individuals that constitute them. To illustrate this, we calculate the gap between the actual share of low-skilled people living together as a couple and the share one would expect on the basis of a random distribution of individual education levels in couples: this gap is more important in Belgium than in the other five countries under review. When we look at homogamy of the high-skilled, however, Belgium is not an outlier, but it is higher than in Germany, France and the Netherlands.

Using the qualification 'insiders' for persons with relatively lower joblessness risks than the average and the qualification 'outsiders' for persons with relatively higher joblessness risks, we may summarize our analysis as follows. Three factors seem to contribute to polarisation, as we see it in Belgium: an overrepresentation of 'insiders' in singles; homogamy of 'insiders', resp. 'outsiders' in couples; a large gap in joblessness risks between 'insiders' and 'outsiders'.

In further work, it is necessary to explore the underlying demographic, economic, sociological and cultural factors in polarisation, in Belgium and elsewhere.

First, with regard to labour market participation, the incentives created by tax, benefit and early exit systems might depend on household circumstances. It is, in theory, conceivable that a tax and benefit system stimulates couples to be either both in employment, or both out of employment. Whether that is the case in countries with high levels of polarisation in the couple subgroup (and, if so, whether it is linked to types of means testing, as in the UK, or household-based social security entitlements, as in Belgium) is an important question for further research.

Second, it may be the case that employment risk pooling in households is affected by the type of jobs that household members are able to find as well as by 'assortative mating' with regard to the types of jobs (rather than by assortative mating with regard to personal features). Further research should explore the potential links between the polarisation of jobs over households and existing research on the changing nature of jobs, such as by Goos et al. (2009) and Autor et al. (2006). An example of a paper linking polarisation of jobs over households to the nature of jobs is Ward and Ozdemir (2013).

Finally, specific trends on the labour market, such as the increasing prevalence of part-time work, call for a more fine-grained concept of employment, both at the individual and household level. The ILO employment concept is limited to a binary status of being in or out of employment. Polarisation should also be analysed over continuous measures of expected and actual household work intensity. This would allow for an analysis of the impact of precarious and part-time employment, which opens up opportunities for a better understanding of in-work poverty.

Figure 1: Individual and (expected and observed) household (non-)employment rates, 1983-2012, Belgium; LFS
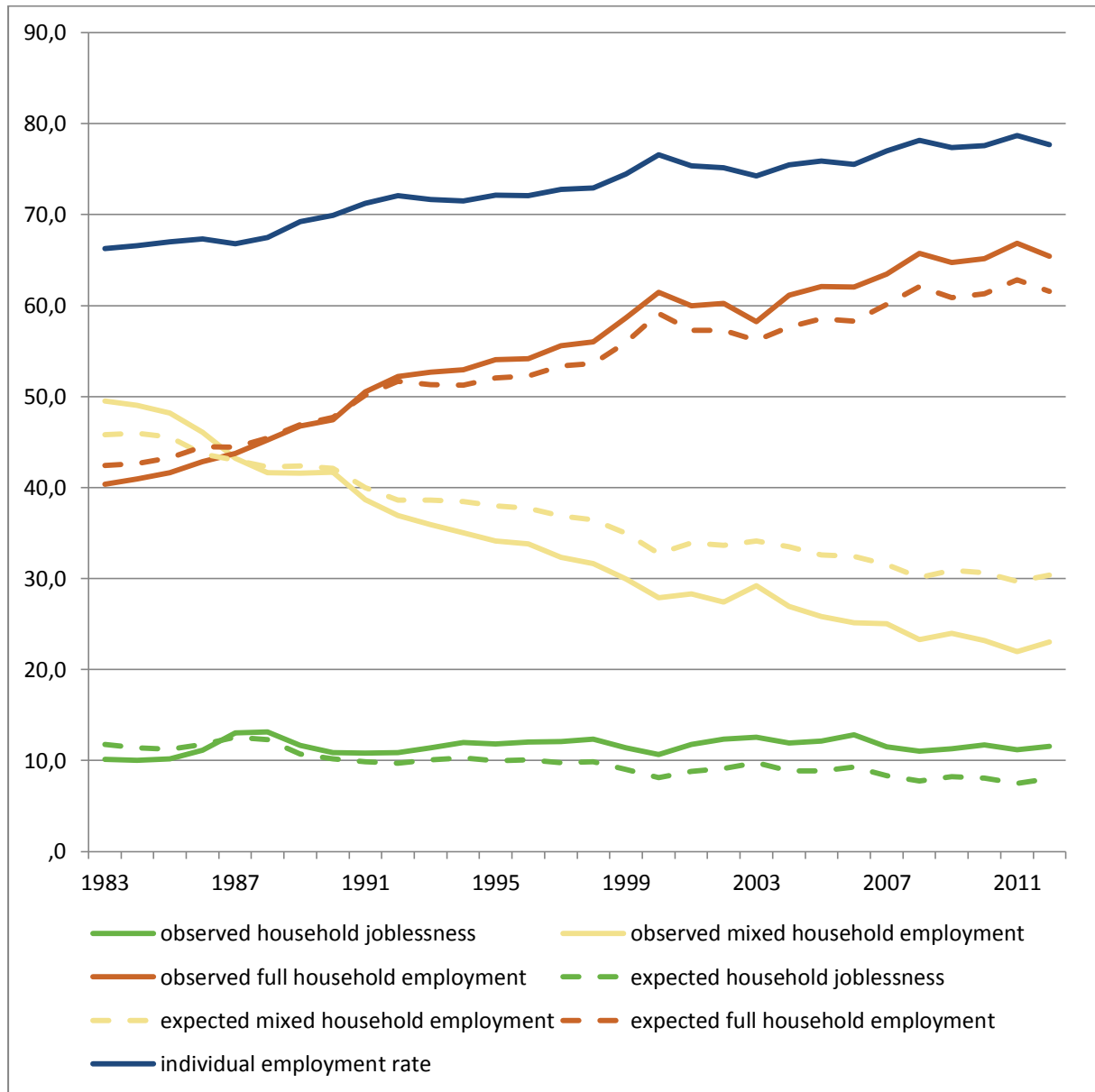
In this figure and all the following figures and tables, years always refer to years of the LFS survey or SILC survey.

Figure 2: Individual and (expected and observed) household joblessness rates, 1983-2012, by region; LFS
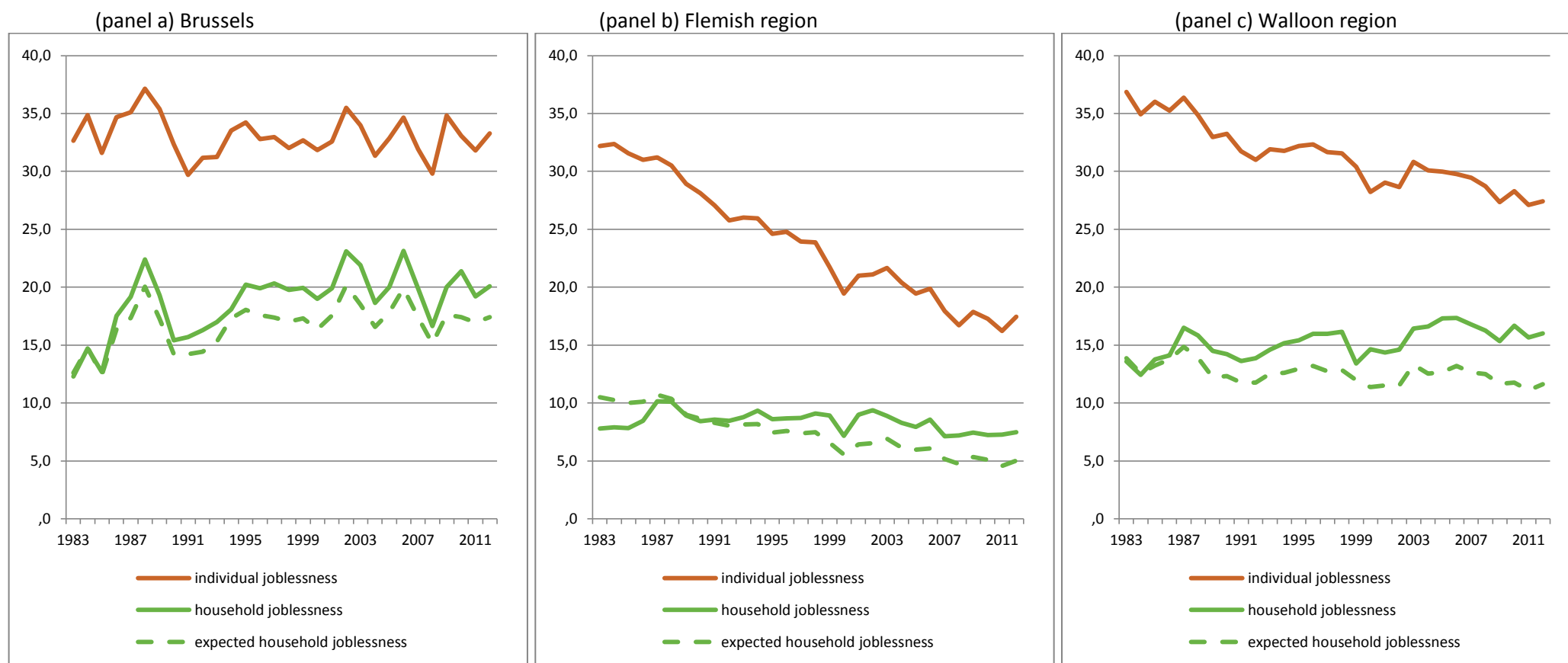
(panel a) Brussels

(panel b) Flemish region

(panel c) Walloon region

- individual joblessness
- household joblessness
- expected household joblessness

Figure 3: Household joblessness rates by household size, 1983-2012, by region; LFS

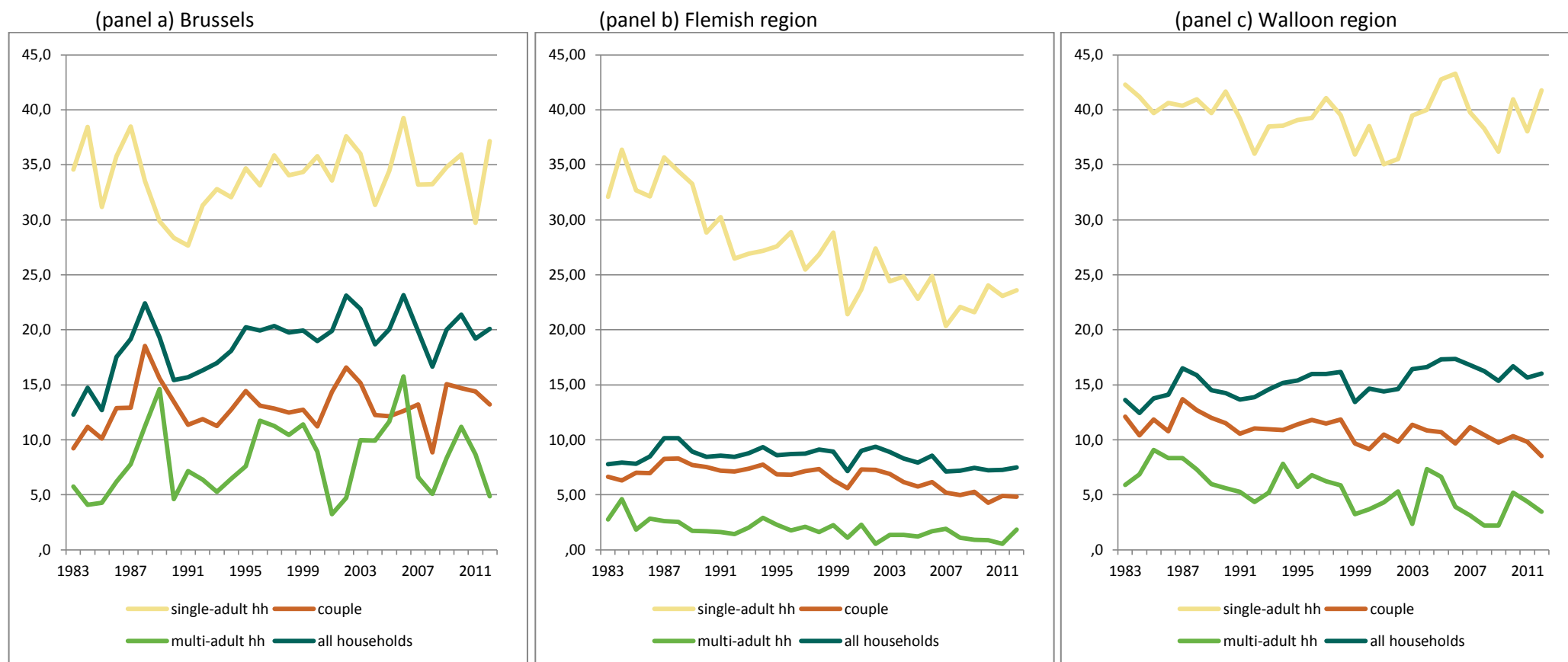(panel a) Brussels

(panel b) Flemish region

(panel c) Walloon region

Figure 4: Household size structure, Belgium, 1983-2012; LFS
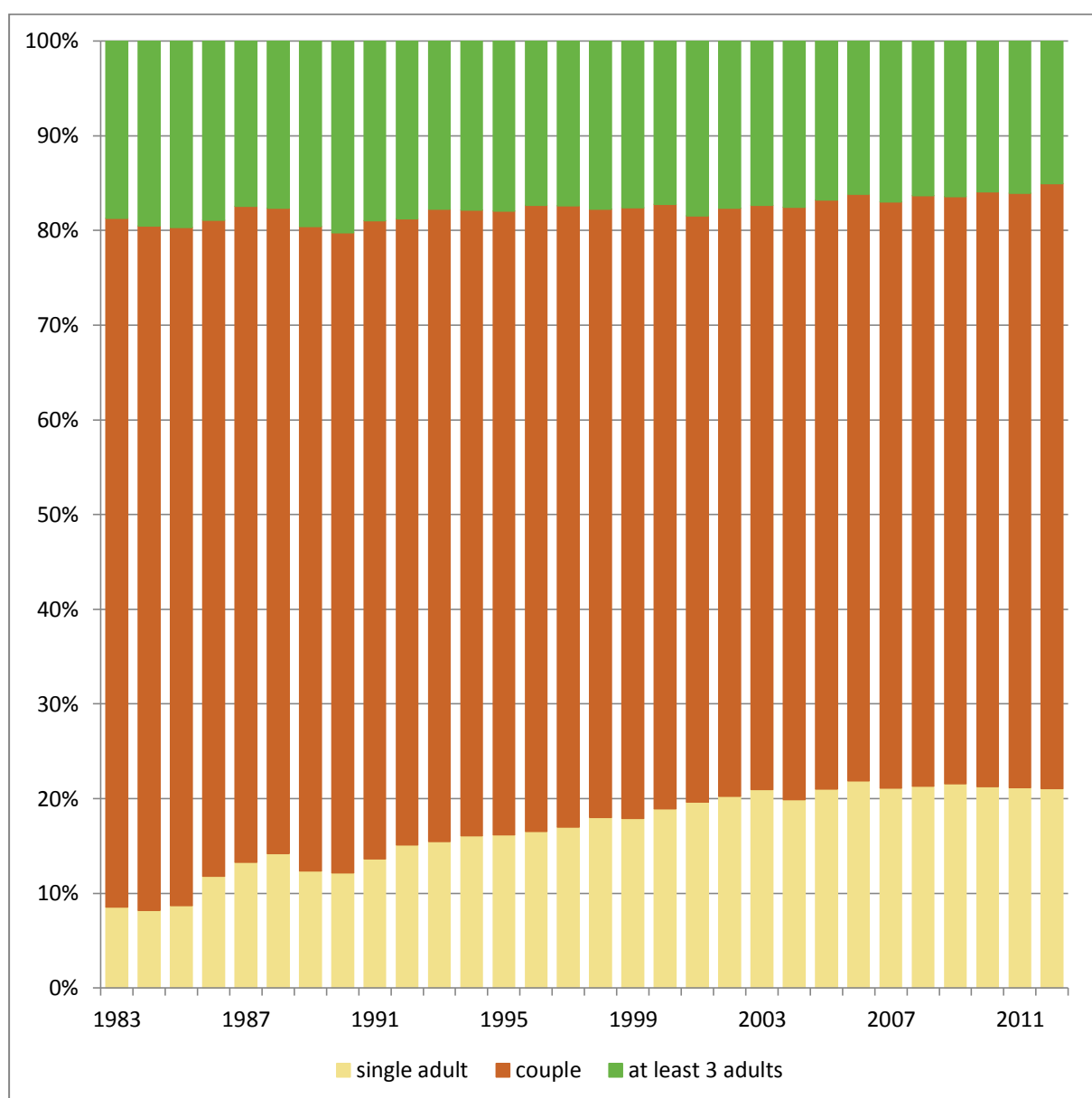
Figure 5: Household size structure, 1983-2012, by region; LFS

(panel a) Brussels
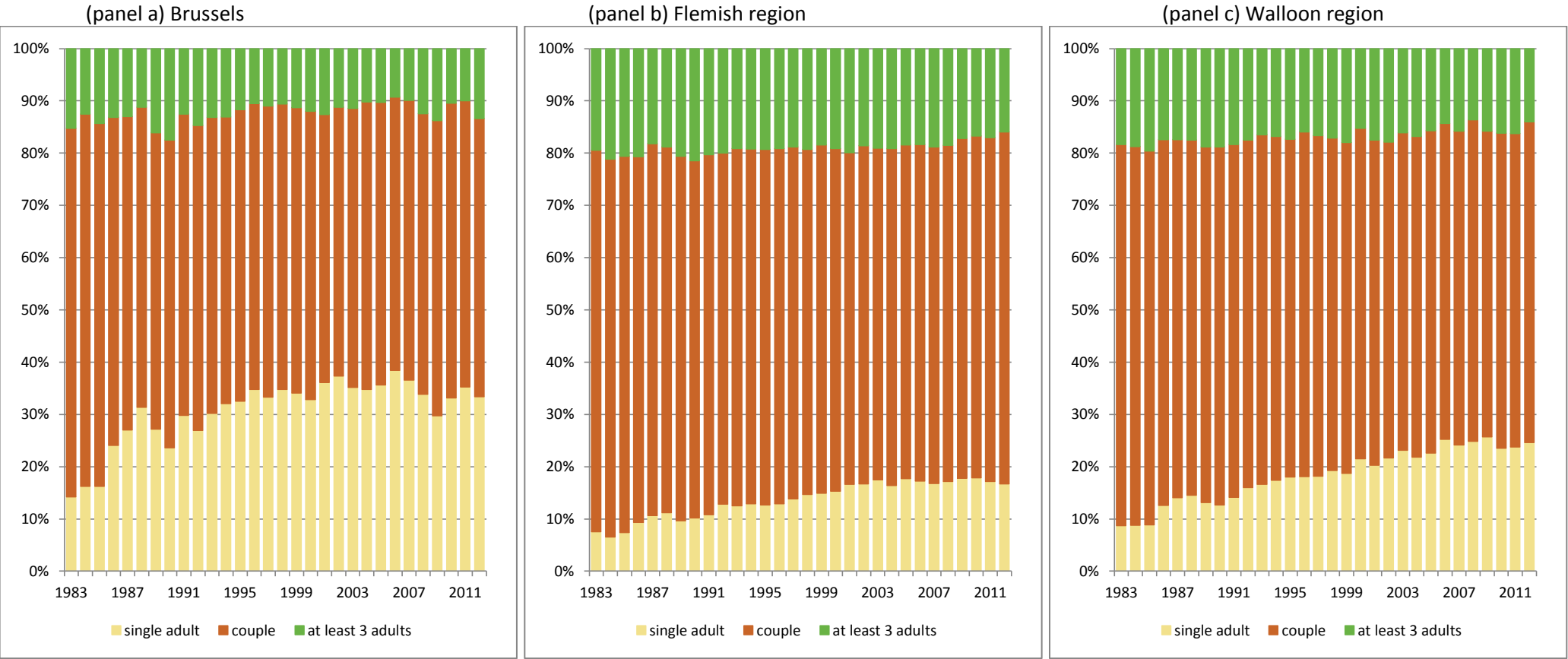
(panel b) Flemish region

(panel c) Walloon region

single adult   couple   at least 3 adults

Figure 6: Evolution of household joblessness, Belgium, by age and region, 1983 – 2012; LFS

(panel a) Brussels

(panel b) Flemish region

(panel c) Walloon region
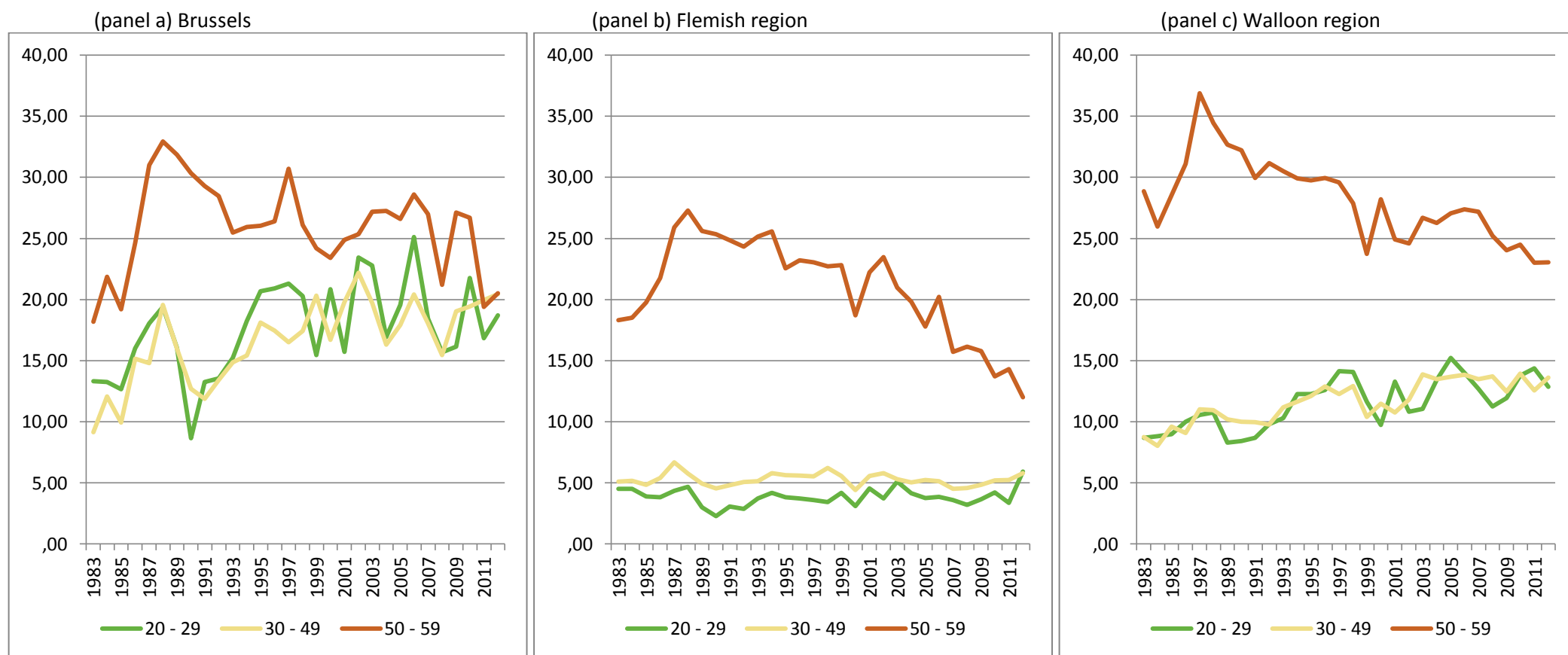
Figure 7: Age distribution of adults in jobless households, 1983-2012, by region; LFS

(panel a) Brussels

(panel b) Flemish region

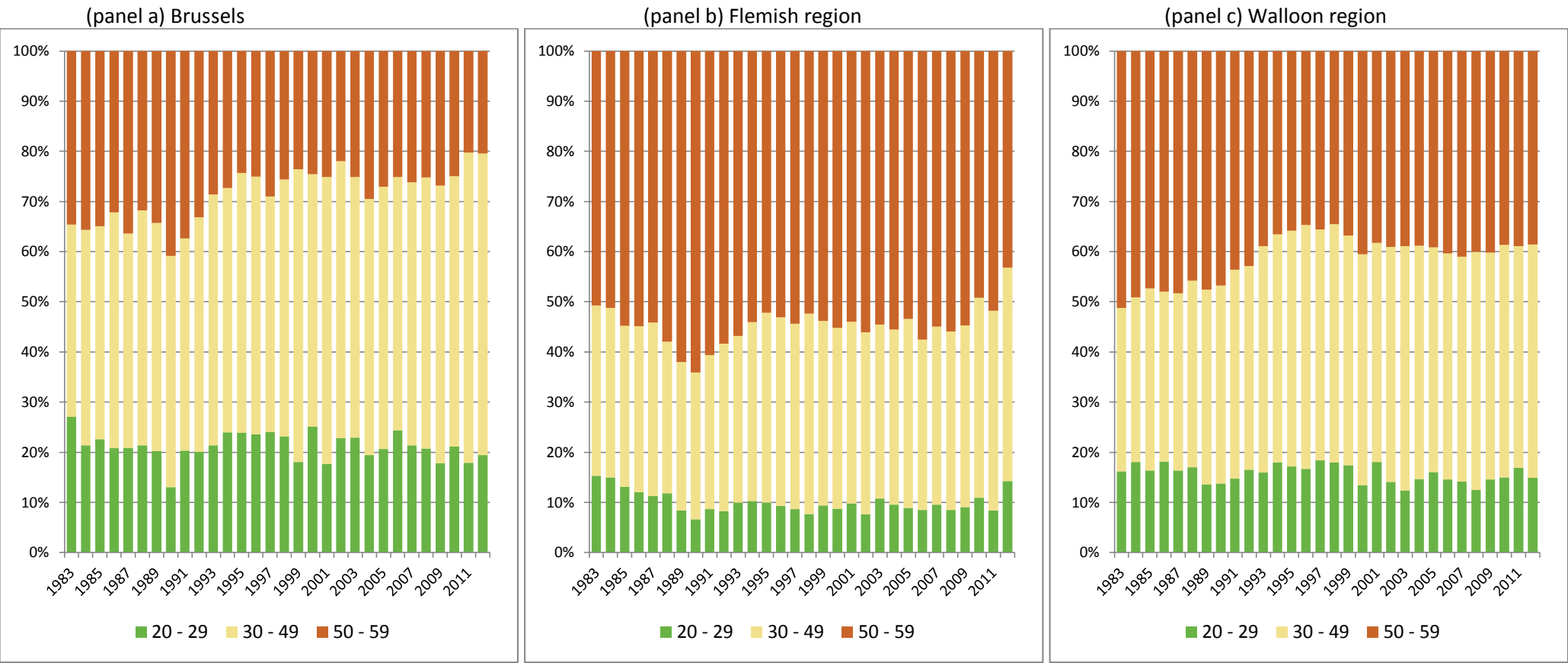(panel c) Walloon region

■ 20 - 29   ■ 30 - 49   ■ 50 - 59

Figure 8: Share of adults with at least one child in the household, as a percentage of all adults living in jobless households, 1983-2012, by region; LFS
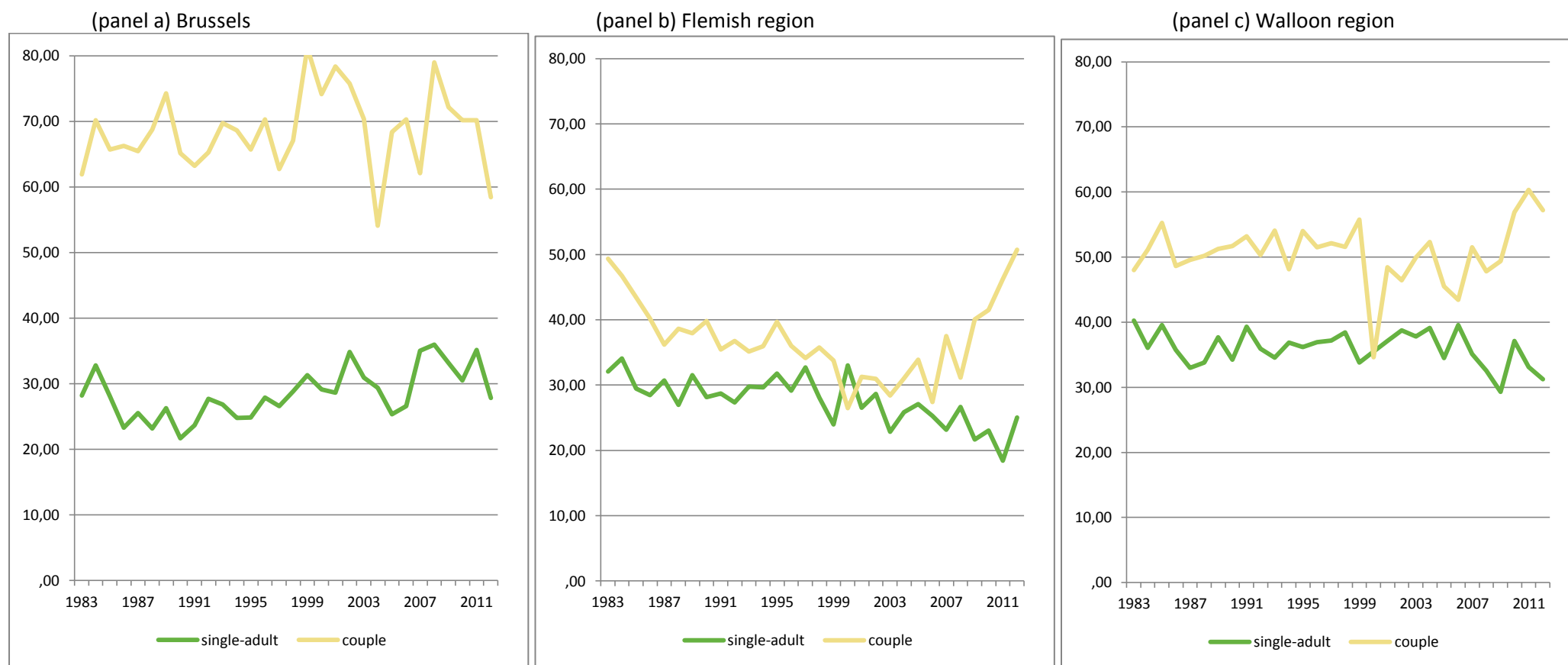

(panel a) Brussels

(panel b) Flemish region

(panel c) Walloon region

Figure 9: Education level of adults in jobless households, 1992-2012, by region: LFS

(panel a) Brussels   (panel b) Flemish region   (panel c) Walloon region

■ no secondary education   ■ secondary education   ■ tertiary education
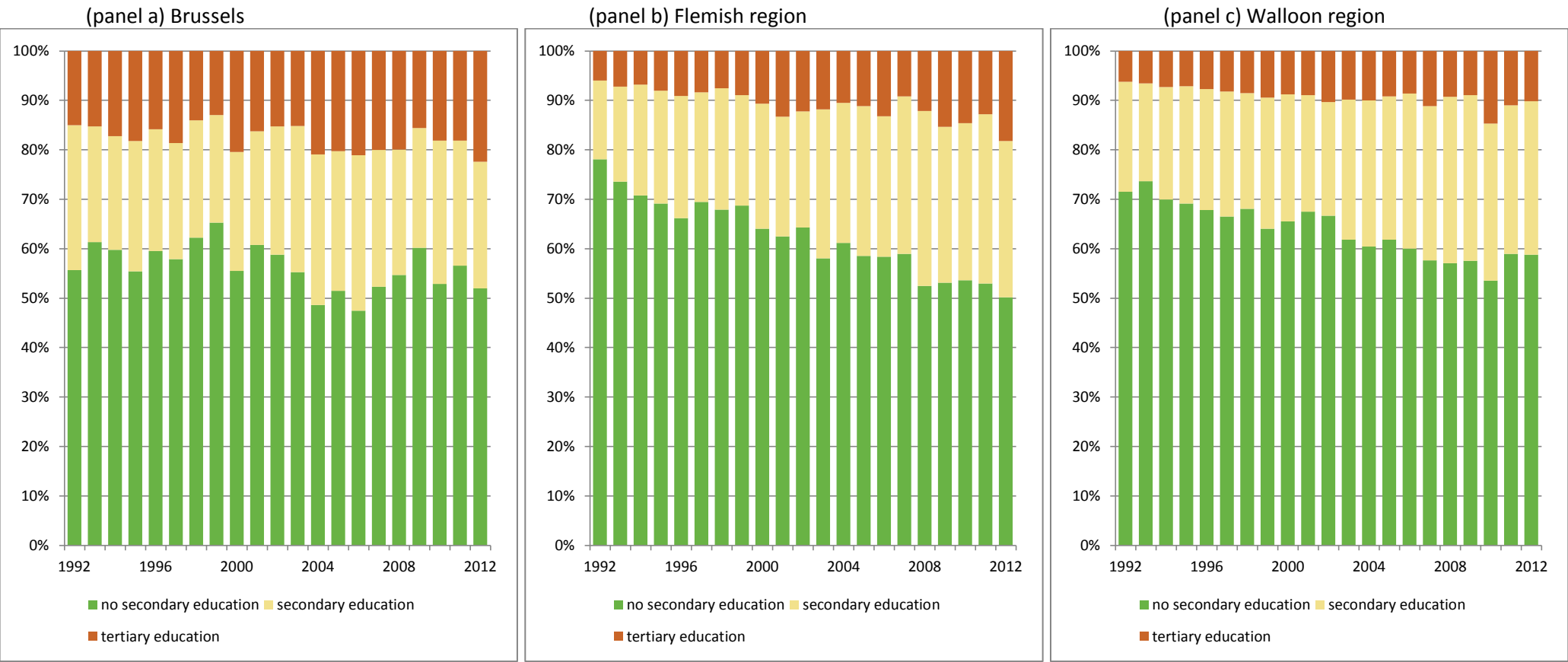
Figure 10: Country of birth of adults in jobless households, 1995-2012, by region; LFS

(panel a) Brussels   (panel b) Flemish region   (panel c) Walloon region

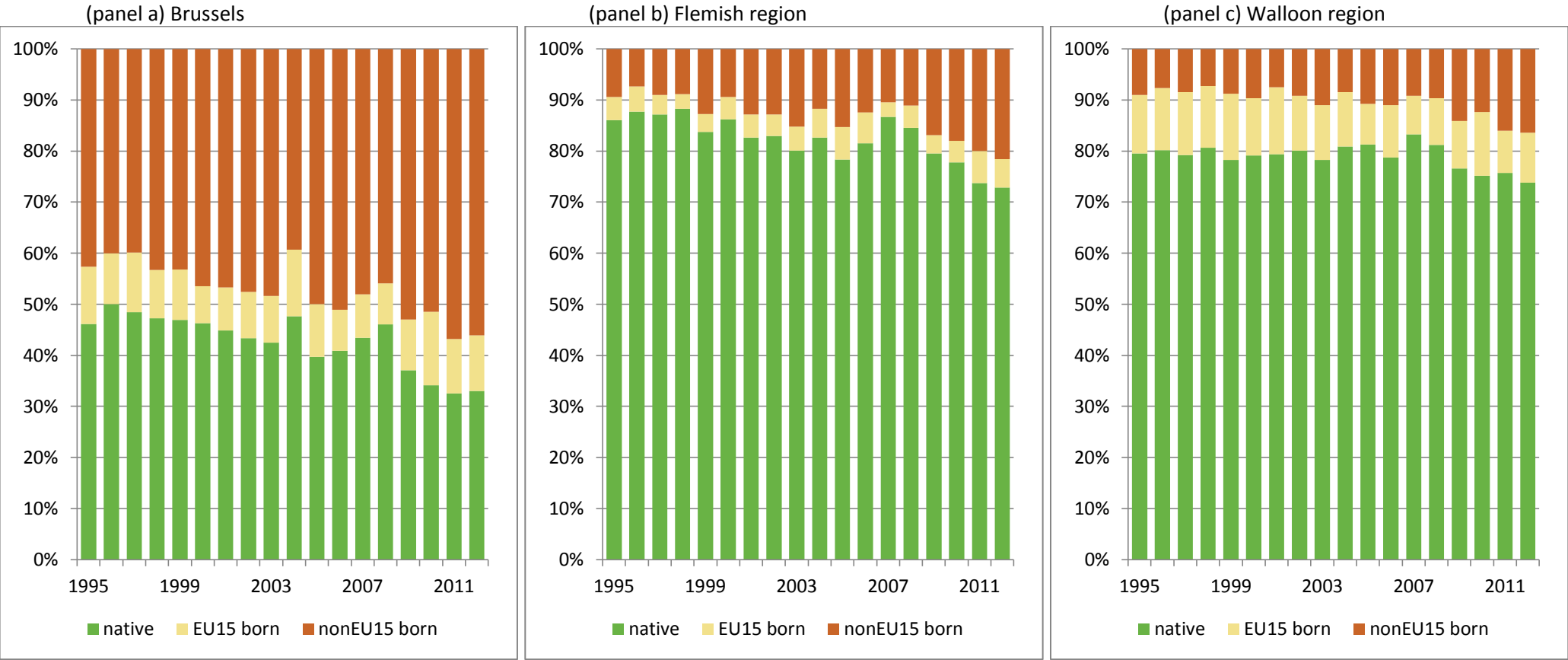native   EU15 born   nonEU15 born

Figure 11: Levels of polarisation, by household size, Belgium, 1983-2012: LFS
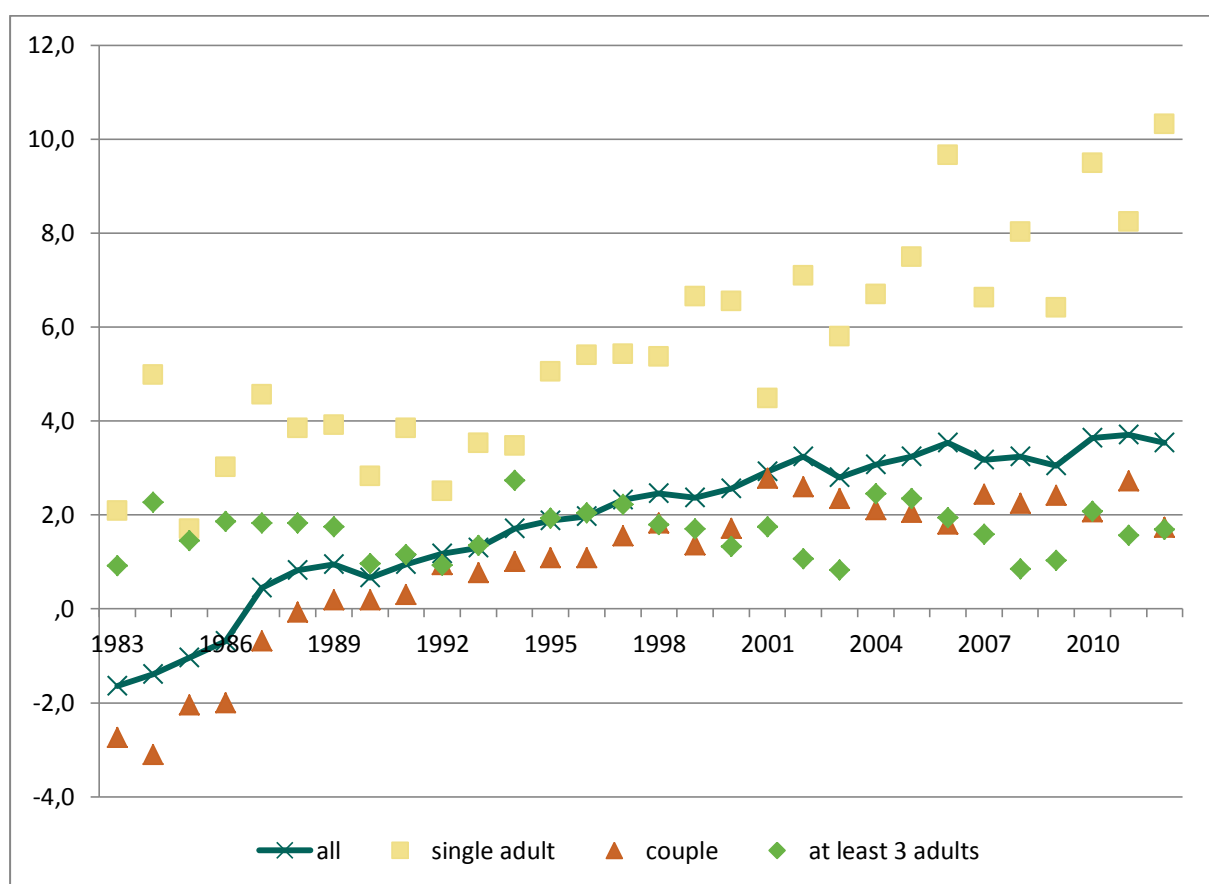
Figure 12: Levels of polarisation by household size, by region, 1983-2012; LFS

(panel a) Brussels   (panel b) Flemish region   (panel c) Walloon region

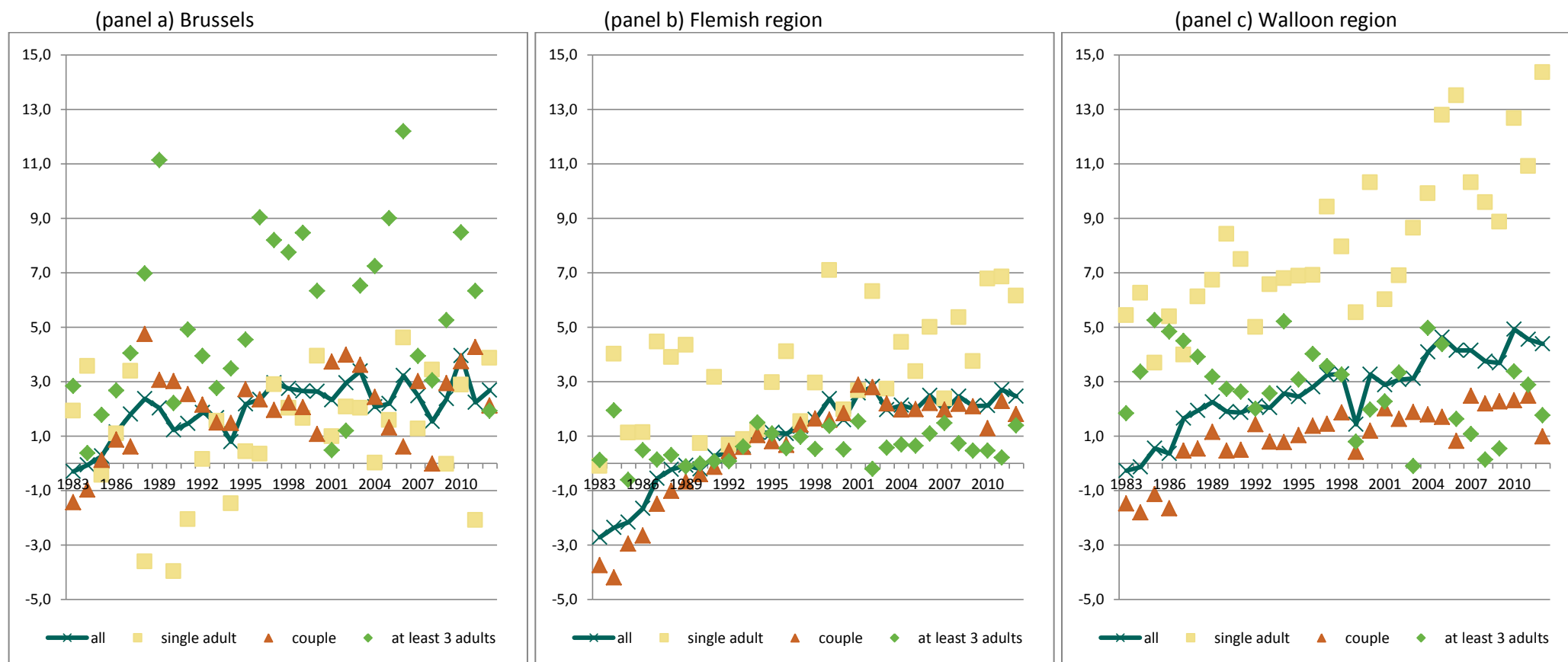Figure 13: Levels of polarisation with weighted contribution by household size, 1983-2012, Belgium; LFS

Figure 14: Levels of polarisation with weighted contribution by household size, 1983-2012, by region; LFS
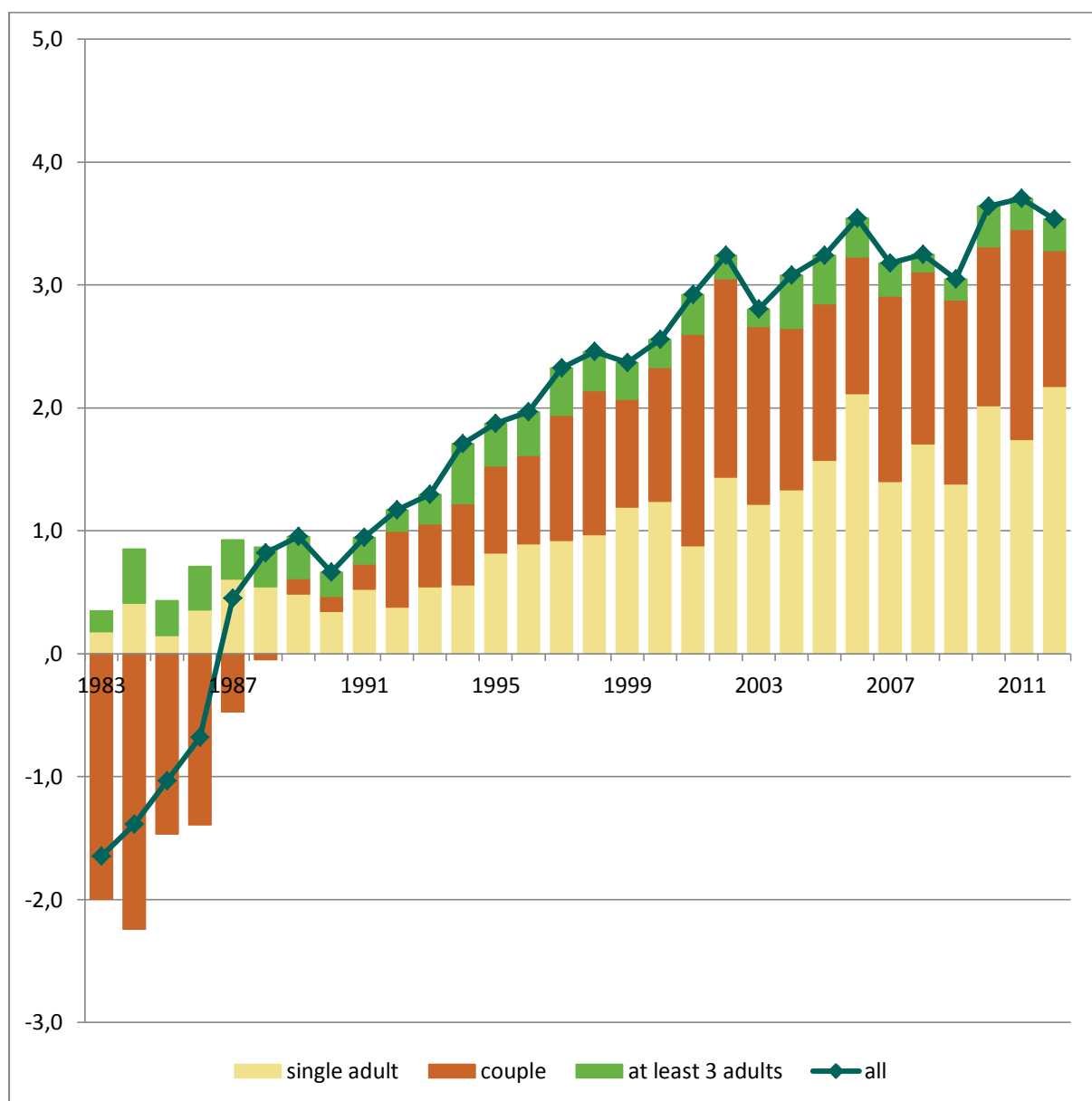

(panel a) Brussels   (panel b) Flemish region   (panel c) Walloon region
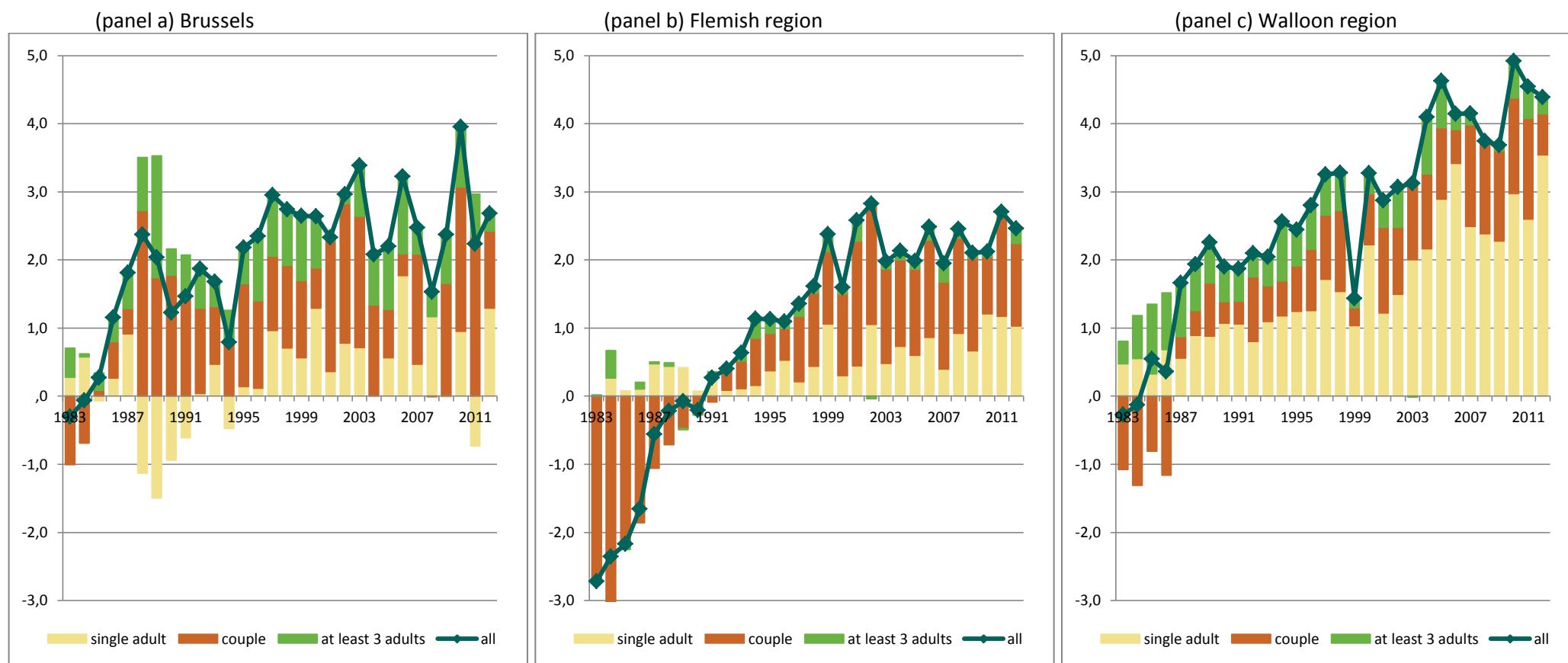
Figure 15: Decomposition of changes in household joblessness, 1983-2012, Belgium and its regions; LFS
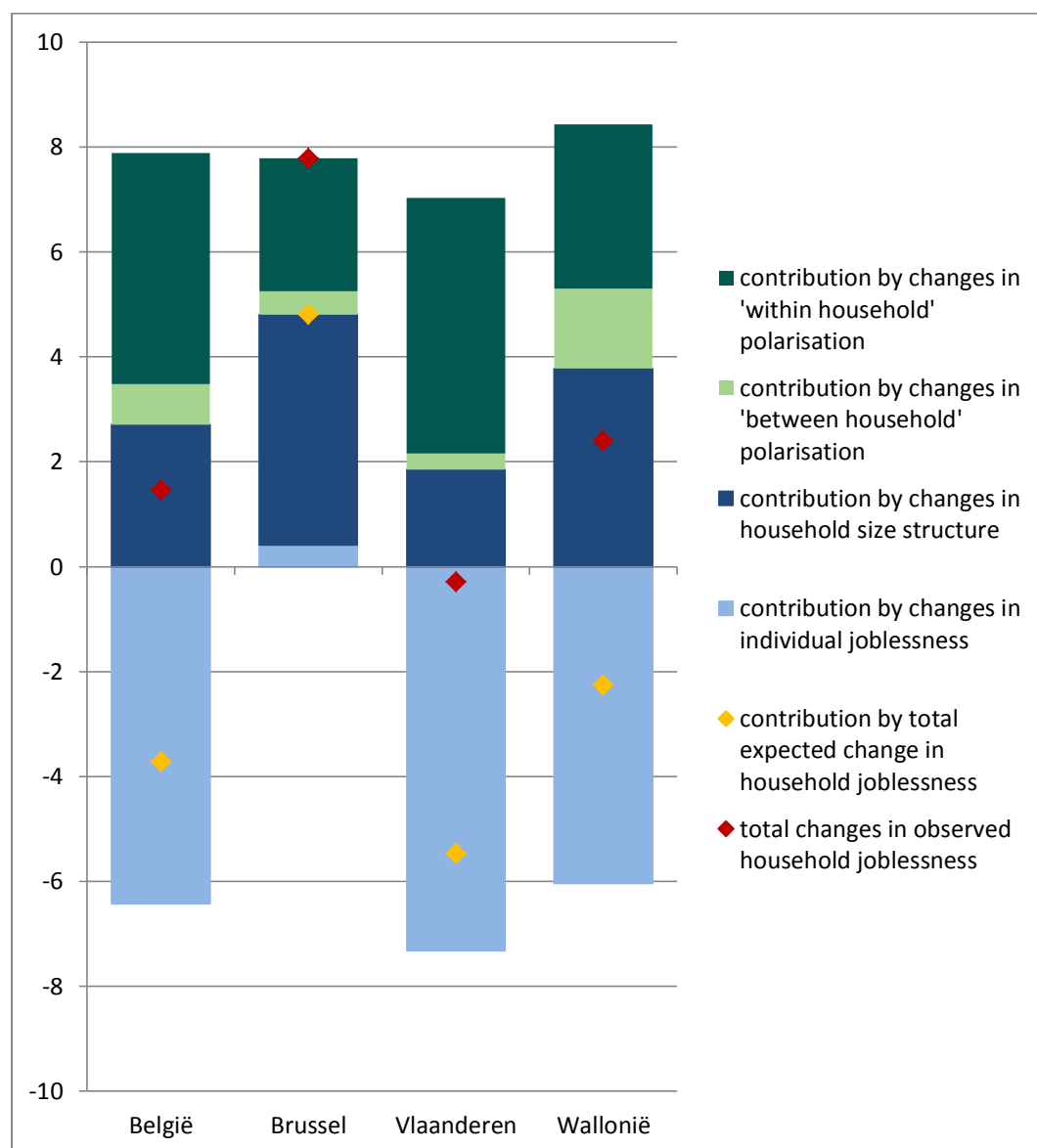
Figure 16: Levels of polarisation, unconditional and conditional, by household size, Belgium, 1993-(1992-)2012; LFS

(panel a) conditional on gender

(panel b) conditional on region
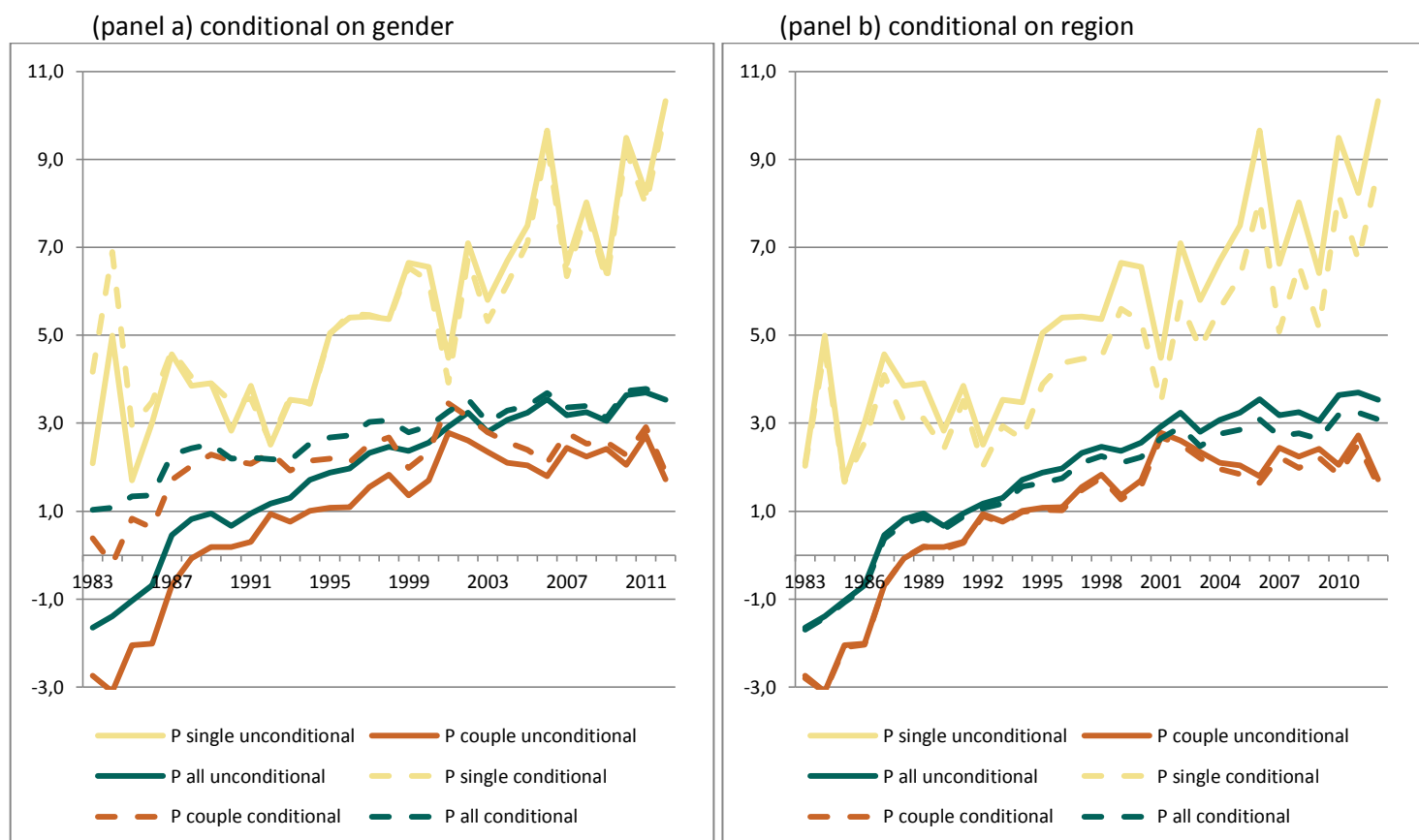
(panel c) conditional on education
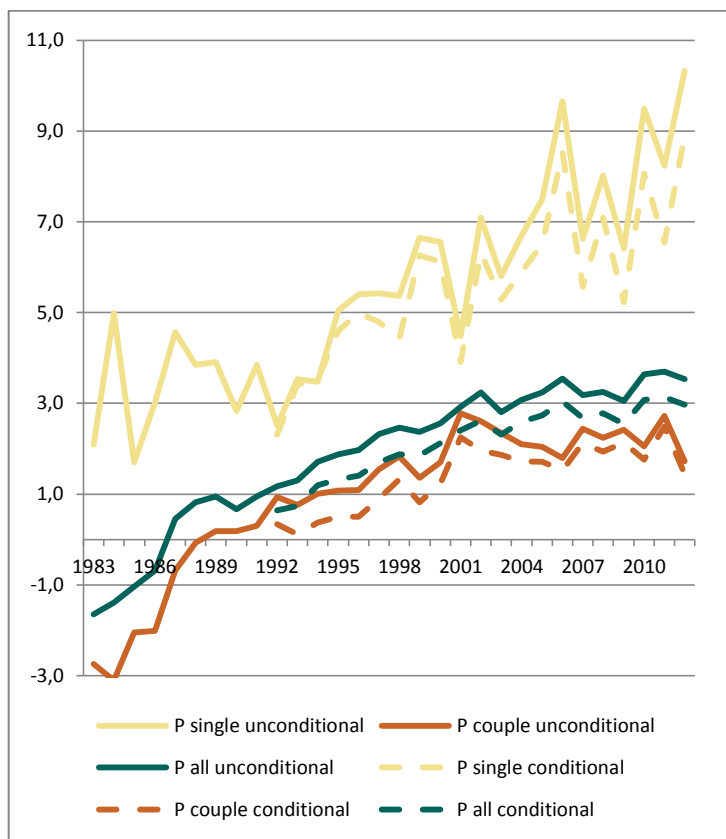
(panel d) conditional on gender, age, education and region
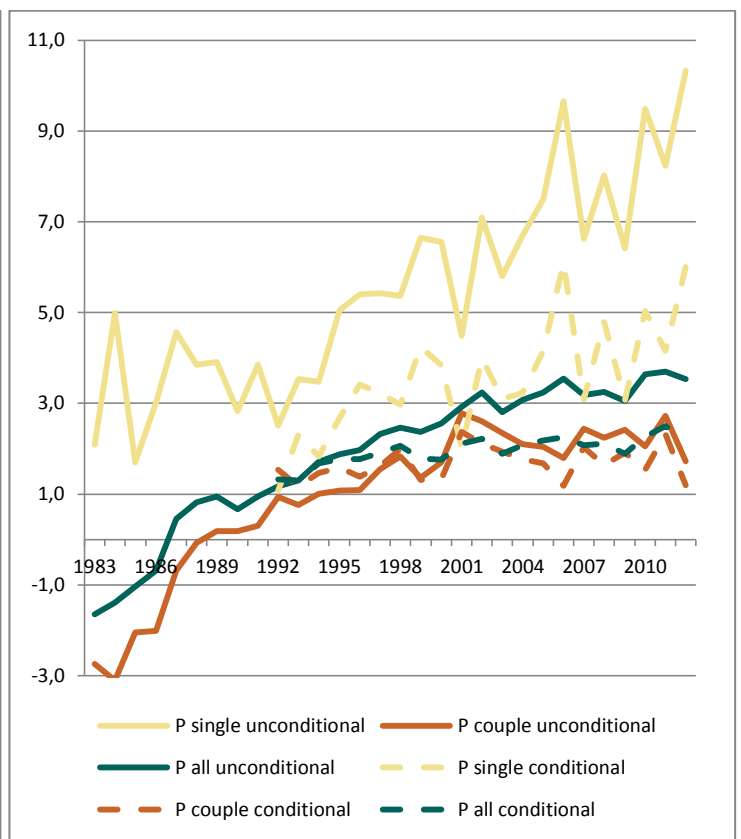
Figure 17: Household size structure, 2012, EU24 (+ Belgian regions); LFS
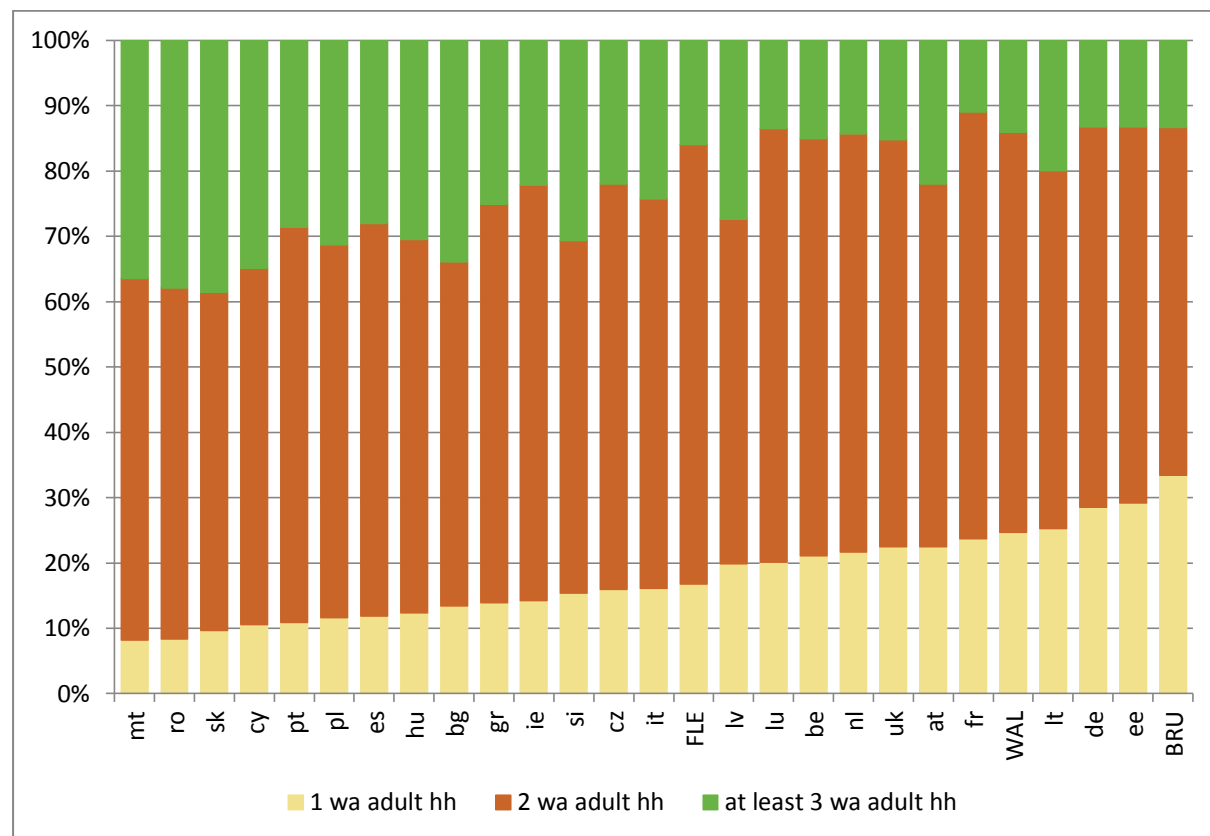
Figure 18: Individual and household joblessness, 2012, EU24 (+ Belgian regions); LFS
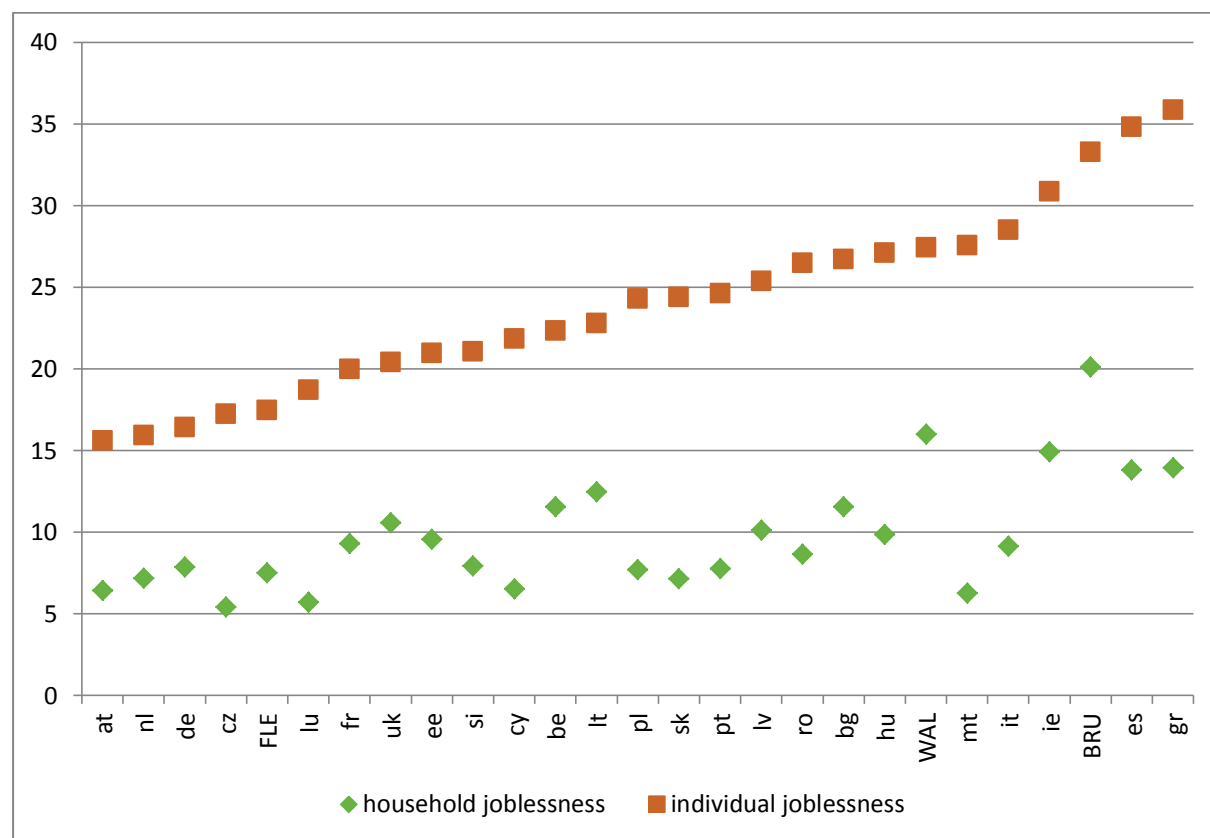
Figure 19: Levels of polarisation, by household size, 2012, EU24 (+ Belgian regions); LFS
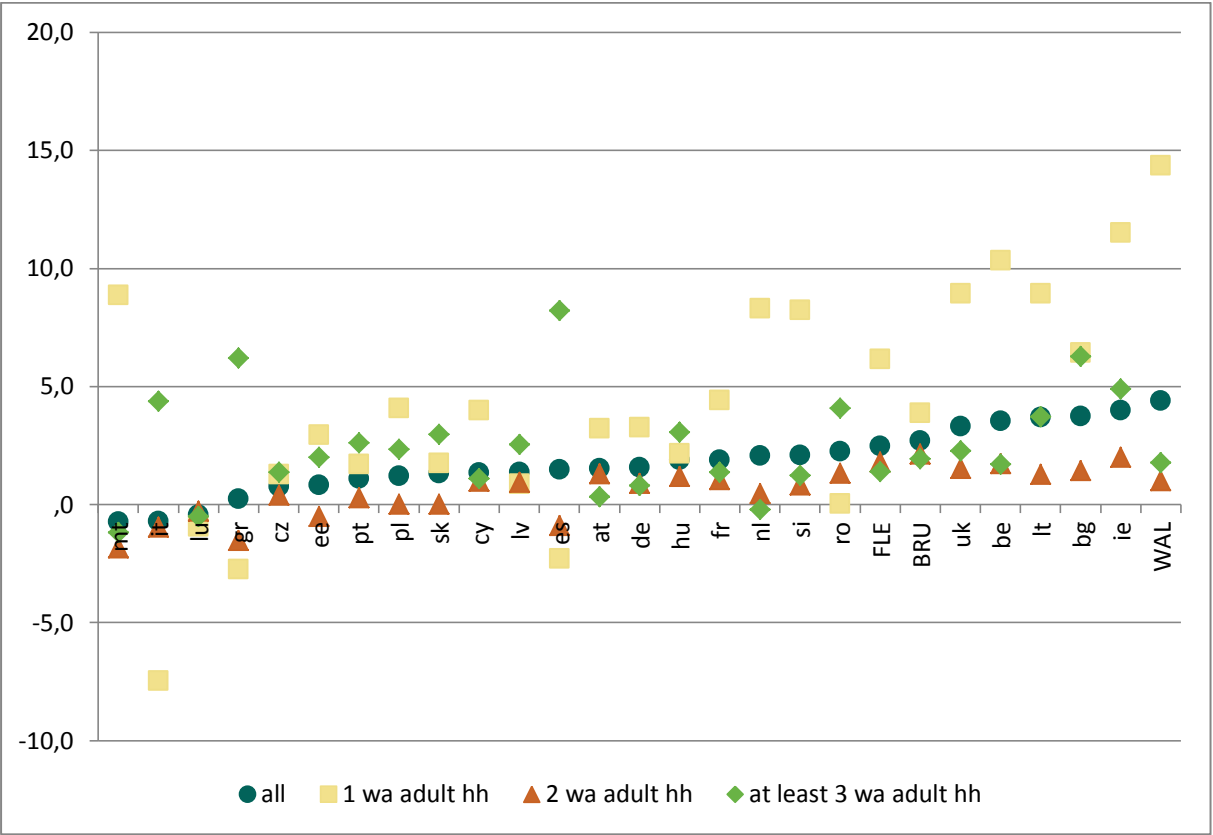
Figure 20: Decomposition of the difference in household joblessness between Belgium and other EU24 countries, 2012; LFS

- differences in household size structure
- differences in individual joblessness
- differences in 'between-household' polarisation
- differences in 'within-household' polarisation
- total differences in household joblessness

Table 1: Marginal effects on the probability of individual joblessness (after probit estimations), Belgium and Belgian regions, Germany, France, the Netherlands, Ireland and the UK, 2012 (reference variable between brackets); LFS

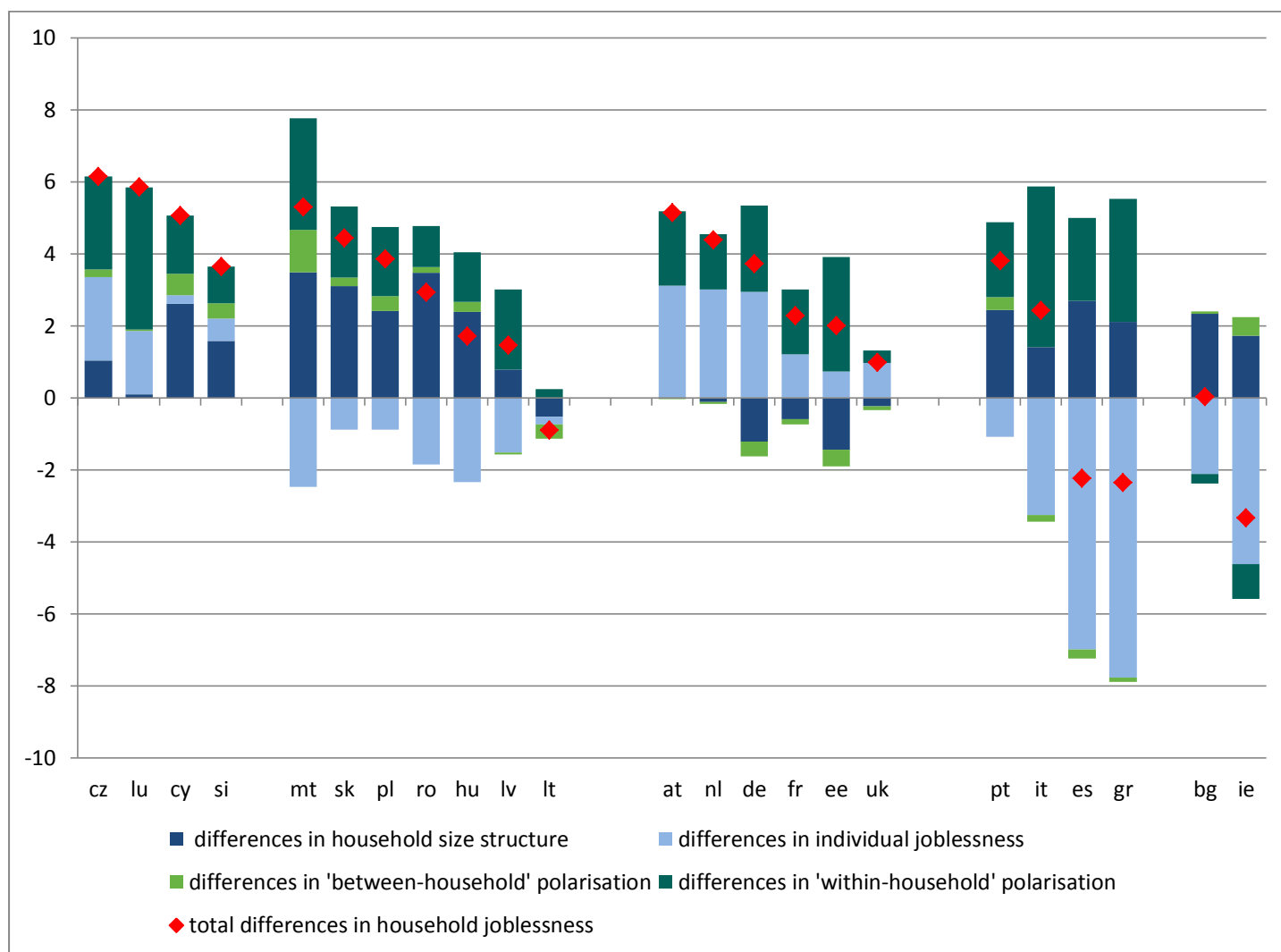|	BRU	FLA	WAL	BE	DE	FR	NL	IE	UK
male (women)	-0.13	-0.10	-0.13	-0.11	-0.07	-0.10	-0.09	-0.11	-0.09
age 20-29 (age 30-49)	0.01	0.02	0.04	0.03	0.00	0.06	-0.02	0.04	0.04
age 50-59 (age 30-49)	-0.01	0.12	0.11	0.10	0.06	0.05	0.05	0.03	0.03
low-skilled (medium skilled)	0.11	0.12	0.16	0.14	0.12	0.10	0.10	0.17	0.15
high-skilled (medium skilled)	-0.15	-0.07	-0.17	-0.11	-0.10	-0.09	-0.06	-0.17	-0.08
origin EU-25 (born in the country)	0.02	0.06	0.01	0.06		0.03	0.06	0.03	0.03
origin non-EU-25 (born in the country)	0.18	0.20	0.16	0.19		0.14	0.13	0.13	0.12
single (hh ≥ 3 adults)	0.05	0.05	0.13	0.09	0.06	0.04	0.10	0.09	0.08
couple (hh ≥ adults)	-0.01	0.00	0.00	0.00	0.01	-0.01	0.01	0.01	0.00

Table 2: Socio-economic profile of singles, relative to the total working age population, for Belgium and Belgian regions, Germany, France, the Netherlands, Ireland, UK, 2012; LFS

|	BRU	FLA	WAL	BE	DE	FR	NL	IE	UK
man	0.99	0.95	0.95	0.96	1.04	0.94	0.99	0.74	0.84
woman	1.01	1.05	1.06	1.05	0.96	1.06	1.01	1.25	1.16
20-29	0.87	0.77	0.81	0.82	1.20	1.00	1.10	0.74	0.81
30-49	1.01	0.99	0.97	0.99	0.93	0.90	0.88	0.98	0.98
50-59	1.09	1.18	1.20	1.15	1.00	1.21	1.17	1.30	1.24
low-skilled	1.06	1.17	1.25	1.21	1.03	1.06	1.00	1.42	1.16
medium-skilled	0.94	0.96	0.93	0.92	1.00	0.99	0.99	0.92	1.02
high-skilled	1.00	0.94	0.87	0.94	0.98	0.97	1.01	0.86	0.89
native	1.01	0.98	0.97	0.94		1.01	0.98	1.04	1.02
EU25	0.96	1.25	1.02	1.22		0.80	1.08	0.90	1.00
non-EU25	1.01	1.07	1.24	1.25		1.00	1.14	0.78	0.89

Table 3: Standard deviation of individual joblessness across population subgroups; Belgium and Belgian regions, Germany, France, the Netherlands, Ireland and UK, 2012; LFS

	BRUS	VLA	WAL	BE	DE	FR	NL	IE	VK
man	27.6	13.2	21.9	17.5	12.0	15.1	11.2	26.3	15.6
woman	39.1	22.0	33.2	27.5	21.1	24.8	20.8	35.2	25.5
standard deviation	**8.1**	**6.3**	**8.0**	**7.1**	**6.5**	**6.9**	**6.8**	**6.3**	**7.0**
20-29	33.7	14.7	25.5	20.5	16.4	22.2	12.3	31.0	21.2
30-49	32.9	13.3	23.0	18.6	14.9	16.9	14.9	28.6	18.8
50-59	33.9	27.7	37.7	31.4	19.6	24.9	21.1	36.9	23.6
standard deviation	**0.5**	**7.9**	**7.9**	**6.9**	**2.4**	**4.1**	**4.5**	**4.3**	**2.4**
low-skilled	52.2	35.4	48.9	42.4	34.2	33.5	29.8	52.6	38.6
medium-skilled	35.3	15.2	25.3	19.9	15.9	19.2	13.6	32.7	18.5
high-skilled	19.6	8.9	11.2	11.0	8.4	11.5	9.1	17.3	12.6
standard deviation	**16.3**	**13.8**	**19.0**	**16.2**	**13.3**	**11.1**	**10.9**	**17.7**	**13.6**
native	23.9	14.6	24.9	18.5		18.0	13.5	30.1	19.0
EU25	26.6	23.1	30.6	26.6		23.8	19.3	31.9	19.7
non-EU25	49.9	44.5	48.2	47.2		37.1	34.0	36.7	29.8
standard deviation	**14.3**	**15.4**	**12.2**	**14.8**		**9.8**	**10.6**	**3.4**	**6.1**

Table 4: Educational homogamy in Belgium and Belgian regions, Germany, France, the Netherlands, Ireland and United Kingdom, 2012; LFS

	BRU	FLA	WAL	BE	DE	FR	NL	IE	UK
low-skilled	6.6	4.7	6.5	5.4	4.0	4.4	3.1	4.8	2.3
medium-skilled	2.1	4.7	4.7	4.8	6.1	5.1	2.9	4.6	3.9
high-skilled	17.3	13.5	13.8	13.9	10.1	11.7	11.2	14.8	14.6

Figure 21: Polarisation: unconditional (random distribution) and conditional on individual characteristics, 2012; LFS
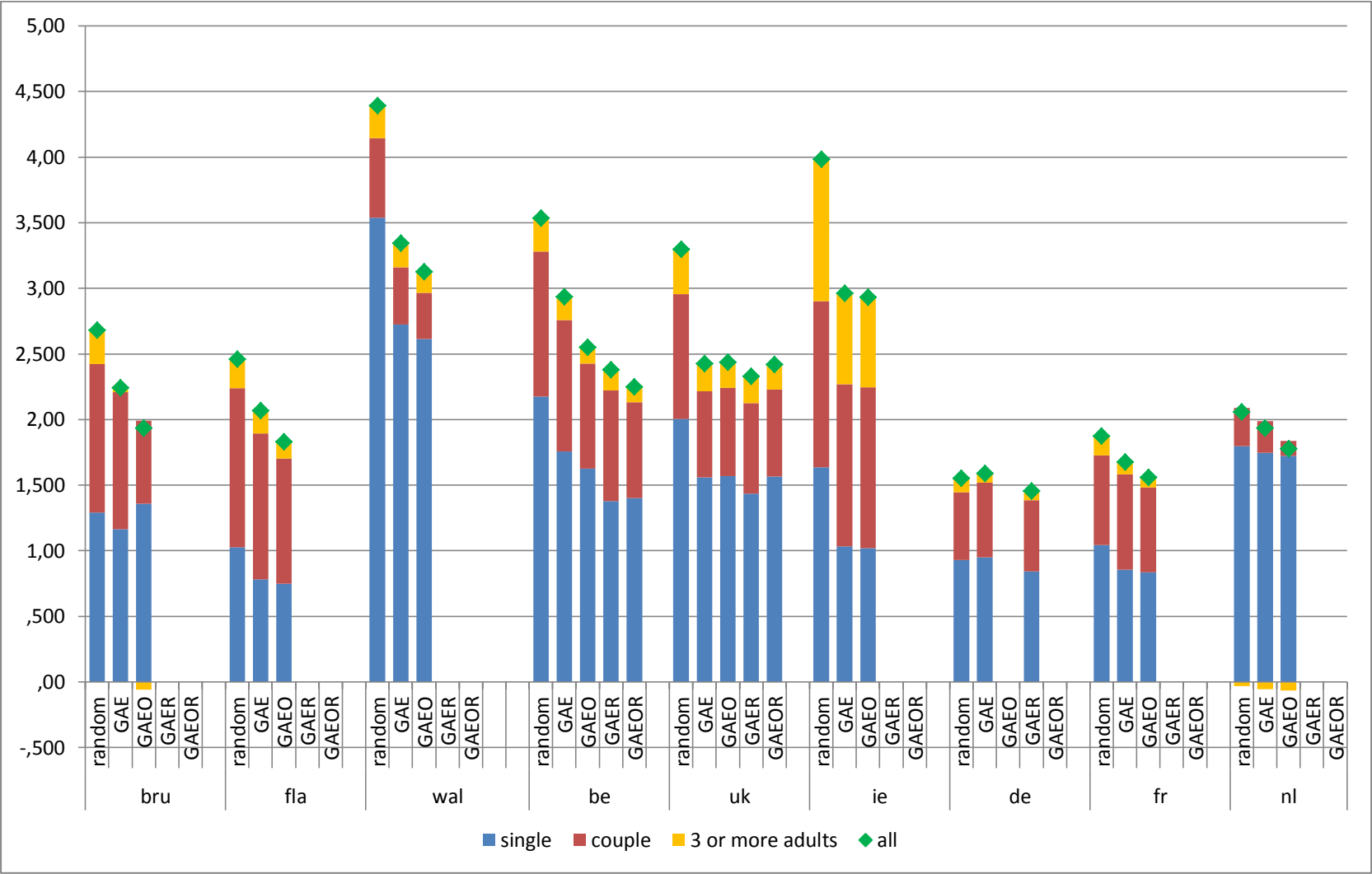
Note:

GAE: conditional polarisation over gender, age and education, for all countries and regions

GAEO: conditional polarisation over gender, age, education and origin, for all countries and regions, except for Germany

GAER: conditional polarisation over gender, age, education and region, for BE, UK and IE

GAEOR: conditional polarisation over gender, age, education, origin and region, for Belgium and the UK

Figure 22: Cross-country comparison of three employment indicators: ratio of individual joblessness to household joblessness (ILO-definition); polarisation; relative severity of work poverty (based on work intensity), 2011; SILC
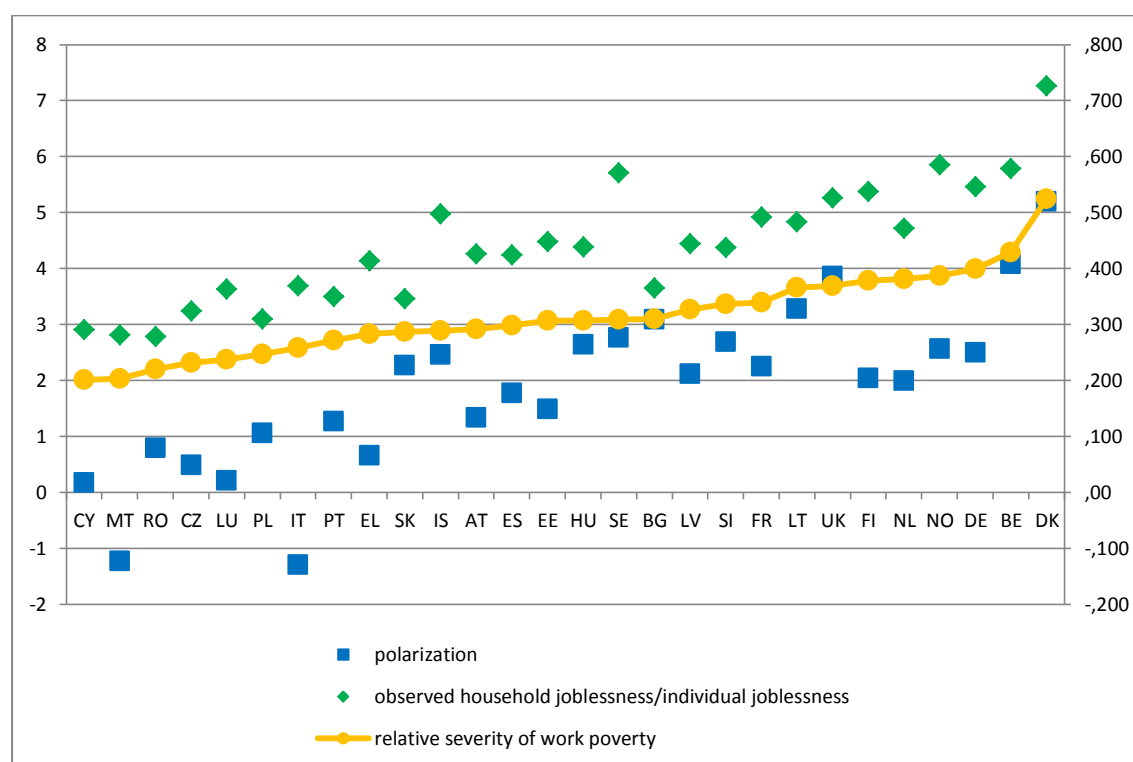

Table 5: Correlation matrix of employment indicators, 2011; SILC

		individual joblessness	observed household joblessness	observed hh jl/individual jl	counterfactual household joblessness	polarisation	share of individuals in work-poor hh	share of individuals in very work-poor hh	relative severity of work poverty
1	individual joblessness	1.00							
2	observed household joblessness	0.50	1.00						
3	observed hh jl/individual jl (= 2/1)	-0.42	0.57	1.00					
4	counterfactual hhousehold joblessness	0.78	0.83	0.15	1.00				
5	polarisation (= 3-4)	-0.38	0.44	0.78	-0.13	1.00			
6	share of individuals in work-poor hh	0.92	0.43	-0.40	0.76	-0.47	1.00		
7	share of individuals in very work-poor hh	0.49	0.91	0.47	0.76	0.39	0.53	1.00	
8	relative severity of work poverty (= 7/6)	-0.30	0.61	0.92	0.16	0.84	-0.33	0.61	1.00

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